MINISTÉRIO DA CIÊNCIA, TECNOLOGIA, INOVAÇÕES E COMUNICAÇÕES
INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS

sid.inpe.br/mtc-m21c/2018/09.24.18.04-TDI

A STUDY OF PLASMA WAVES IN THE INDUCED MAGNETOSPHERES OF MARS AND VENUS

Adriane Marques de Souza Franco

Doctorate Thesis of the Graduate Course in Space Geophysics, guided by Drs. Ezequiel Echer, and Maurício José Alves Bolzam, approved in October 25, 2018.

URL of the original document:
<http://urlib.net/8JMKD3MGP3W34R/3RSM69S>

INPE
São José dos Campos
2018

PUBLISHED BY:

Instituto Nacional de Pesquisas Espaciais - INPE
Gabinete do Diretor (GBDIR)
Serviço de Informação e Documentação (SESID)
CEP 12.227-010
São José dos Campos - SP - Brasil
Tel.:(012) 3208-6923/7348
E-mail: pubtc@inpe.br

MINISTÉRIO DA CIÊNCIA, TECNOLOGIA, INOVAÇÕES E COMUNICAÇÕES
INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS

sid.inpe.br/mtc-m21c/2018/09.24.18.04-TDI

A STUDY OF PLASMA WAVES IN THE INDUCED MAGNETOSPHERES OF MARS AND VENUS

Adriane Marques de Souza Franco

Doctorate Thesis of the Graduate Course in Space Geophysics, guided by Drs. Ezequiel Echer, and Maurício José Alves Bolzam, approved in October 25, 2018.

URL of the original document:
<http://urlib.net/8JMKD3MGP3W34R/3RSM69S>

INPE
São José dos Campos
2018

Cataloging in Publication Data

Franco, Adriane Marques de Souza.

F848e A study of plasma waves in the induced magnetospheres of Mars and Venus / Adriane Marques de Souza Franco. – São José dos Campos : INPE, 2018.

xxx + 264 p. ; (sid.inpe.br/mtc-m21c/2018/09.24.18.04-TDI)

Thesis (Doctorate in Space Geophysics) – Instituto Nacional de Pesquisas Espaciais, São José dos Campos, 2018.

Guiding : Drs. Ezequiel Echer, and Maurício José Alves Bolzam.

1. Mars and Venus induced magnetospheres. 2. Plasma waves. 3. Correlation length. 4. Atmospheric loss. I.Title.

CDU 52-854:523.42/.43

Aluno (a): *Adriane Marques de Souza Franco*

Título: "UM ESTUDO DE ONDAS DE PLASMA NAS MAGNETOSFERAS INDUZIDAS DE MARTE E VÊNUS"

Aprovado (a) pela Banca Examinadora em cumprimento ao requisito exigido para obtenção do Título de *Doutor(a)* em

Geofísica Espacial/Ciências do Ambiente Solar-Terrestre

Dra. Maria Virginia Alves

Presidente / INPE / SJCampos - SP

( ) Participação por Video - Conferência

(X) Aprovado *( ) Reprovado*

Dr. Ezequiel Echer

Orientador(a) / INPE / SJCampos - SP

( ) Participação por Video - Conferência

(X) Aprovado *( ) Reprovado*

Dr. Maurício José Alves Bolzam

Orientador(a) / UFG / Jataí - GO

( ) Participação por Video - Conferência

(X) Aprovado *( ) Reprovado*

Dr. Renato Sergio Dallaqua

Membro da Banca / INPE / São José dos Campos - SP

( ) Participação por Video - Conferência

(X) Aprovado *( ) Reprovado*

Este trabalho foi aprovado por:

( ) maioria simples

(X) unanimidade

São José dos Campos, 25 de outubro de 2018

Aprovado (a) pela Banca Examinadora em cumprimento ao requisito exigido para obtenção do Título de *Doutor(a)* em

Geofísica Espacial/Ciências do Ambiente Solar-Terrestre

Dr. Fábio Becker Guedes

Membro da Banca / INPE / São José dos Campos - SP

( ) Participação por Vídeo - Conferência

(X) Aprovado *( ) Reprovado*

Dr. Manilo Soares Marques

Convidado(a) / UFRN / Natal - RN

( ) Participação por Vídeo - Conferência

(X) Aprovado *( ) Reprovado*

Dr. Edio da Costa Júnior

Convidado(a) / IFMG / Ouro Preto - MG

( ) Participação por Vídeo - Conferência

(X) Aprovado *( ) Reprovado*

Este trabalho foi aprovado por:

( ) maioria simples

(X) unanimidade

São José dos Campos, 25 de outubro de 2018

“If I have seen further than others, it is by standing upon the shoulders of giants”.

Isaac Newton

I dedicate this thesis to my mother and father, and also to my husband Francis Franco for their endless support.

ACKNOWLEDGMENTS

First of all, I would like to thank God for make me feel strong and believe in myself in the moments that I needed.

I thank my supervisors Dr. Ezequiel Echer, Dr. Mauricio José Alves Bolzam and Dr. Markus Fraenz to the orientation that was given in the development of this thesis that allowed it been completion. For all explanations, helps with methodology and patience with my limitations.

To the INPE professors for all transmitted knowledge.

To my colleagues: Anna Karina, Jenny Marcela, Fabiola Magalhães and Williamary Portugal for their attention, contributions to the development of this work and also for adventures in conferences.

I also would like to thank my family and friends that always supported me.

To the CAPES (Coordination for the Improvement of Higher Level – OR Education Personnel), and FAPESP (São Paulo Research Foundation, grants Nº 2016/10794-2 and Nº 2017/00516-8), for the financial support of my PhD.

To the Max Planck institute for Solar System Research for receiving me during my sandwich fellowship and provides me all support that I needed to develop my research.

To the National Institute for Space Research (INPE), for the opportunity and support in my formation.

ABSTRACT

Plasma waves are considered as an essential factor in the physics of planetary magnetospheres, since they may transfer energy and momentum from the solar wind to the inner magnetospheric cavity. In Mars and Venus, where the magnetosphere is formed by the interaction of the solar wind with the upper atmosphere/ionosphere of the planet (induced magnetospheres), the low energy ion escape is mainly related to the extreme ultra-violet radiation and solar wind pressure. But the solar wind pressure and interaction with the planetary bow shock increases the wave production in the magnetosheath. It is unclear to what degree magnetic shielding can prevent that ultra low frequency waves generated in the sheath penetrate into the ionosphere. Thus, these waves may provide enough energy to accelerate ionospheric ions, so that they reach escape speed, contributing to the atmospheric erosion of the planet. In this thesis, these plasma waves have been studied in the induced magnetospheres of Mars and Venus using three different techniques: correlation lengths for both planets, wavelet transform in the identification of the main frequency of these waves in the magnetosheath of Mars and transport ratios to identify dominant wave modes for Venus. It was found that the main frequencies in the magnetosheath of Mars are in the range between 5 and 20 mHz. These frequencies did not show any dependence with the solar cycle. Correlation lengths around Mars were computed for Mars express (MEX) data (electron density from 2004 to 2015) and for Mars Atmosphere and Volatile Evolution Mission (MAVEN) data (electron density and magnetic field from 2014 to 2016). Correlation length in electron density data was found to be varying between 13 and 17 seconds (temporal scale) and between $5.5x10^3$km and $6.8x10^3$ km (spatial scale) for the MEX analysis. For MAVEN it varies between 11 and 16 seconds (temporal scale) and $2x10^3 - 4.5x10^3$ km in spatial scale. In the magnetic field data, correlation lengths are observed between 8-15 seconds (temporal scale) and between $1x10^3$ and $5x10^3$ km (spatial scale). In Venus similar correlation lengths have been seen using Venus express (VEX) data (2006-2014). It varies from 9 to 14 seconds (temporal) and from $2.8X10^3$ to $5X10^3$km (spatial scale) in the electron density data. For magnetic field, correlation length was found between 7.5-11 seconds (temporal) and $1.7x10^3$-$4X10^3$km (spatial). For both planets it was seen that the sizes of the plasma regions are smaller than the observed correlation lengths observed inside them, which indicates that waves at the magnetosheath/magnetic pile-up region (MPR) can be related to oscillations in the ionosphere. In a local region, wave trains may cause resonance effects at the planetary ionopause, which consequently contributes to the enhanced ion escape from the atmosphere. For Mars, 29 cases of potential wave penetration into the ionosphere were identified. The predominant wave mode around Venus was the Alfvenic mode,

which can be observed everywhere, mostly inside of the magnetosheath and in the upstream solar wind.

Keywords: Mars and Venus Induced Magnetospheres. Plasma Waves. Correlation Length. Atmospheric Loss.

ESTUDO DE ONDAS DE PLASMA NAS MAGNETOSFERAS INDUZIDAS DE MARTE E VENUS

RESUMO

Ondas de plasma são consideradas como um fator essencial na física magnetosférica, já que as mesmas podem transferir energia e momento do vento solar para o interior da cavidade magnetosférica. Em Marte e Vênus, onde a interação do vento solar ocorre diretamente com a alta atmosfera/ionosfera do planeta (magnetosfera induzida), o escape de íons de baixas energias está relacionado à radiação no ultravioleta extremo e à pressão dinâmica do vento solar. A pressão dinâmica do vento solar aumenta a produção de ondas na bainha magnética, e como a blindagem magnética é incapaz de impedir que ondas de frequência ultra-baixa geradas na magnetobainha penetrem na ionosfera marciana, essas podem fornecer energia suficiente para acelerar íons ionosféricos, de modo que estes atinjam velocidade de escape, contribuindo para a erosão da atmosfera planetária. Nesta tese de doutorado estas ondas de plasma foram estudadas nas magnetosferas induzidas de Marte e Vênus usando três diferentes técnicas: Comprimento de correlação para ambos os planetas, transformada ondeletas na identificação das principais frequências dessas ondas na bainha magnética de Marte e as taxas de transporte para a identificação dos modos de onda dominantes para Vênus. As principais frequências identificadas na bainha magnética de Marte estão na faixa entre 5 e 20 mHz. Essas frequências não apresentam dependência com o ciclo solar. O comprimento de correlacão em torno de Marte foi calculado usando dados da *Mars Express* (MEX) (densidade de elétrons de 2004 a 2015) e da *Mars Atmosphere and Volatile Evolution Mission* (MAVEN) (densidade de elétrons e campo magnético de 2014 a 2016). Nos dados de densidade de elétrons, o comprimento de correlação foi encontrado variando entre 13 e 17 segundos (escala temporal) e $5.5x10^3$-$6.8x10^3$ km (escala espacial) para a análise usando dados da MEX. Para MAVEN, o comprimento de correlação varia entre 11 e 16 segundos (temporal) e entre $2x10^3 - 4.5x10^3$km em escala especial. Nos dados de campo magnético, comprimentos de correlação são observados entre 8-15 segundos (temporal) e entre $1x10^3$ e $5x10^3$ km (escala espacial). Em Vênus, comprimentos de correlação similares são observados usando dados da *Venus* Express (VEX) (2006-2014), variando entre 9-14 segundos em escala temporal e entre $2.8x10^3$- $5x10^3$ km em escala espacial nos dados de densidade de elétrons. Para o campo magnético, o comprimento de correlação foi encontrado entre 7.5 e 11 segundos (temporal) e de $1.7x10^3$ a $4X10^3$km (escala espacial). Para ambos os planetas foi visto que os tamanhos das regiões de plasma são menores que o comprimento de correlação nas mesmas. Isso indica que ondas na bainha magnética/região de acúmulo magnético podem ser relacionadas a

oscilações na ionosfera. Em uma região local, trens de onda causam efeitos ressonantes na ionopausa do planeta, que consequentemente contribuem para o escape de íons da atmosfera planetária. Em Marte, 29 casos potenciais de penetração de ondas na ionosfera foram identificados. O modo de onda de Alfvén foi identificado como o predominante na magnetosfera Venusiana. Este pode ser observado em todas as partes da magnetosfera, principalmente dentro da bainha magnética e no vento solar anterior a frente de choque.

Palavras-chave: Magnetosferas Induzidas de Marte e Vênus. Ondas de Plasma. Comprimento de Correlação. Perda Atmosférica.

LIST OF FIGURES

Pág.

LIST OF TABLES

Pág.

LIST OF ABBREVIATIONS AND ACRONYMS

ASPERA-3	Analyzer of Space Plasma and Energetic Atoms-3
ASPERA-4	Analyzer of Space Plasma and Energetic Atoms-4
BS	Bow Shock
CIR	Corotating Interaction Region
CL	Correlation Length
CME	Coronal Mass Ejection
DPU	Digital Processing Unit
ELS	Electron Spectrometer
ENA	Energetic Neutral Atoms
ESA	European Space Agency
EUV	Extreme Ultra-Violet
FOV	Front of View
GWS	Global Wavelet Spectrum
ICA	Ion Composition Analyzer
ICB	Ion Composition Boundary
ICME	Interplanetary Coronal Mass Ejections
ICWT	Inverse Continuous Wavelet Transform
IMA	Ion Mass Analyzer
IMF	Interplanetary Magnetic Field
IUVS	Imaging Ultraviolet Spectrograph
HILDCAAs	High-Intensity Long Duration Continuous AE Activity

HSS	High Speed Stream
LF	Low Frequency
LPW	Langmuir Probe and Waves
MAG	Magnetometer
MAG/ER	Magnetometer and Electron Reflectometer
MARSIS	Mars Advanced Radar for Subsurface and Ionosphere Sounding
MAVEN	Mars Atmosphere and Volatile Evolution
MCP	Micro-Channels Plate
MB	Magnetic Barrier
MEX	Mars Express
MGS	Mars Global Surveyor
MHD	MagnetoHydrodynamics
MPB	Magnetic Pile-up Boundary
MPR	Magnetic Pile-up Region
MPS	Max Planck Institute for Solar System Research
MSO	Mars Solar Orbital
NGIMS	Neutral Gas and Ion Mass Spectrometer
NPD	Neutral Particle Detector
NPI	Neutral Particle Imager
PEB	Photo-Electron Boundary
PFS	Planetary Fourier Spectrometer
PVO	Pioneer Venus Orbiter

R_m	Mars Radius
R_v	Venus Radius
SEP	Solar Energetic Particle
SPICAM	Spectroscopy for the Investigation of the Characteristics of the Atmosphere of Mars
SPICAV/SOIR	Atmosphere of Venus/ Ultraviolet and Infrared Atmospheric Spectrometer
STATIC	Suprathermal and Thermal Ion Composition
SWEA	Solar Wind Electron Analyzer
SWIA	Solar Wind Ion Analyzer
SWP	Solar Wind Pressure
SZA	Solar Zenith Angle
ULF	Ultra Low-Frequency
VEX	Venus Express
VIRTIS	Visible and Infrared Thermal Imaging Spectrometer
VMC	Venus Monitoring Camera
VeRa	Venus Radio-Science Experiment
VSO	Venus Solar Orbital
WFT	Windowed Fourier Transform
WT	wavelet Transform

CONTENTS

Pág.

1 INTRODUCTION

The interaction of the magnetized solar wind with magnetic fields and with ionized atmospheres of the planets creates a region around the planetary body called magnetosphere. The term magnetosphere was introduced by Gold (1959), with a limited definition, where this term was used to describe the space region in which the main forces acting on the plasma are of electrodynamic nature and are resulting of the planetary magnetic field.

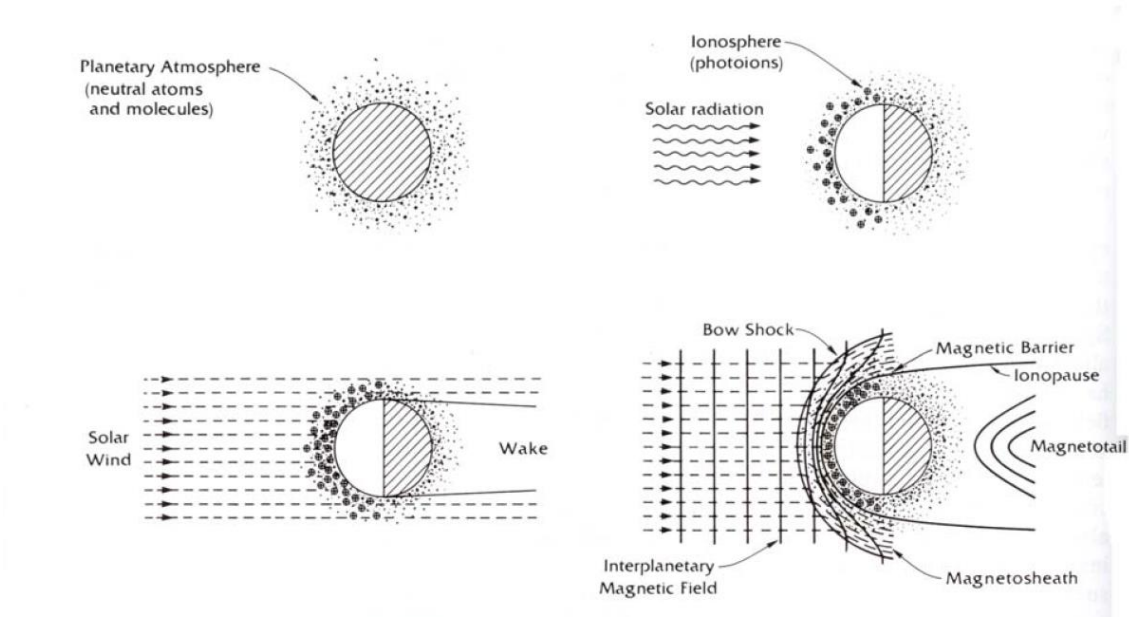
Planetary magnetospheres can be intrinsic or induced. They are called intrinsic magnetospheres when the planet has an active magnetic field (defined by Gold), where the size of spatial scale is obtained through the balance of the pressure between the planetary magnetic field and the pressure that the interplanetary plasma exerts on the magnetosphere (SPREITER; ALKSNE, 1969). On the other hand, induced magnetospheres are a consequence of the electric conductivity of the atmospheres or of the interior of an obstacle (KIVELSON; BAGENAL, 2007). The term induced magnetosphere was created by Podgorny et al. (1980), describing the interaction of the solar wind with comets and Venus.

The variability in the magnetospheric characteristic and its form is due to the several conditions of the solar wind and due to the charged particle motion inside the magnetosphere (PATER; LISSAUER, 2010; ESPLEY, 2018). From the eight planets in our solar system, only Venus and Mars present induced magnetospheres (PODGORNY et al., 1980).

The upper atmospheres of Venus and Mars are ionized mainly by solar extreme ultraviolet (EUV) radiation and X-rays, and then a conductive ionosphere is formed in the upper atmosphere of planet (LUHMANN et al., 1987; SHAN et al., 2015; RAMSTAD et al., 2017). The solar wind traveling in the interplanetary medium carries with it the frozen magnetic field lines from the Sun, due to the high conductivity of the solar wind (KIVELSON; RUSSELL, 1995). This magnetic field, called Interplanetary Magnetic Field (IMF), which is highly variable with time, when interacting with conductive ionospheres, obeying the Faraday-Lenz law, will generate electric currents. As the IMF cannot penetrate

through the conducting layer, its piles-up in front of it and as consequence of the magnetic field the incident solar wind flux is deflected. Thereby, the deflected solar wind flows around the planet in a region similar to a magnetosphere created by an intrinsic magnetic field, as it is illustrated in Figure 1.1 (CLOUTIER; DANIELL, 1973; CLOUTIER; DANIELL, 1979; LUHMANN et al., 2004; KIVELSON; BAGENAL, 2007; ECHER, 2010; DIÉVAL et al., 2011).

Figure 1.1- Illustration of the steps of formation of an induced magnetosphere.



Source: Luhmann et al. (1987).

Although both planets, Mars and Venus, present induced magnetospheres, there are some specific planetary characteristics that can influence in the interaction between the solar wind and each planet.

Table 1.1 shows some planetary characteristics, solar wind parameters near the planets and scales lengths that are important for that interaction for Venus, Earth and Mars.

Table 1.1- Planetary characteristics, solar wind parameters and scale lengths for Venus, Earth and Mars.

	Venus	Earth	Mars
Planetary average radius (km)	6052	6371	3390
Mass (kg)	$4.87x10^{24}$	$5.97x10^{24}$	$6.39x10^{23}$
Distance from the Sun (astronomical unit AU = $1.5x10^{8}$km)	0.72 AU	1	1.5 AU
Escape velocity (km/s)	10.4	11.2	5.0
Current Magnetization	No	Dynamo (active)	Crustal (remnant)
Solar Wind Magnetic field, B(nT)	13.05	5.49	4.29
Solar Wind Density n (cm^{-3})	19.04	9.87	4.22
Electron Temperature $T_e(K)$	$1.64x10^{5}$	$1.39x10^{5}$	$1.12x10^{5}$
Solar wind magnetosonic Mach Number	4.5	6.1	6.1
Ion Inertial Length $\frac{C}{\omega_{pi}}$ (km)	52	72	110
Ion Gyroradius (H^+) $\frac{V_{SW}}{\omega_{ci}}$ (km)	320	760	970

Source: Adapted from Moses et al. (1988).

Another element that plays a big role in the solar wind planetary magnetosphere coupling are Ultra-Low Frequency (ULF) waves, since those waves are a potential factor in the energy and momentum transfer from the solar wind to the magnetosphere. Besides that, even though in an indirect form, those waves can interfere in the subjacent physics of the Martian magnetosphere regions (RUHUNUSIRI et al., 2015a). Consequently, these waves are related to the process of the loss of Martian atmosphere via solar wind interaction.

The objective of this thesis is to study the ULF waves in the induced magnetospheres of Mars and Venus. In order to conduct those studies, the follow objectives were established:

- Identify the plasma boundaries of the Magnetosphere of Mars for 2004 and from 2014 to 2016, with the goal of updating the plasma boundaries catalog;

- Identify the main periods of ULF plasma oscillations in those intervals, applying the wavelet transform to the electron density and electron temperature data for the MEX magnetosheath crossings between the years 2005 and 2016.

- Compute the correlation length around Mars using electron density data from MEX for 10 years of the mission (2004-2014) and dividing the analysis for periods of high and low solar wind pressure;

- Compute the correlation length around Mars using electron density and magnetic field data from the Mars Atmosphere and Volatile Evolution (MAVEN) for two years of the mission (2014-2016);

- Search for cases of ULF waves penetration into the ionopause of Mars;

- Compute the correlation length around Venus using electron density and magnetic field data for the whole interval of the Venus Express (VEX) mission (2006-2014);

- Study the ULF wave mode distribution around Venus for the whole VEX mission (2006-2014).

In order to conduct this work and meeting these objectives, this thesis is divided in 5 chapters, being this, the first one, the introduction.

Chapter 2 presents a theoretical foundation about the characteristics and configuration of the induced magnetospheres of Mars and Venus and also about ULF waves in the interplanetary medium and planetary magnetospheres.

The Chapter 3 approaches the instrumentation and methodologies that were used in this thesis, where a brief presentation of the instruments from MEX, MAVEN and VEX used are made. The methodologies, wavelet transform, correlation length and the wave mode identification method are also presented.

In Chapter 4 the results obtained are shown divided in two subsections; the first dedicated to the results obtained for Mars and the second to the results for Venus.

The last chapter, Chapter 5, is dedicated to the discussions and conclusions of this work.

2 THEORETICAL FOUNDATIONS

In this chapter a theoretical foundation of the important concepts for the development of this work is presented. It was divided in two main subsections. In the section 2.1 the configurations of the induced magnetospheres of Mars and Venus are shown. The second subsection, 2.2 is dedicated to introduce the basic concepts about ULF waves in the interplanetary medium and planetary magnetospheres with emphasis on induced magnetospheres.

2.1 Induced Magnetospheres

As it was described in the previous section, Mars and Venus present induced magnetospheres, and a brief introduction of their magnetospheres is presented below.

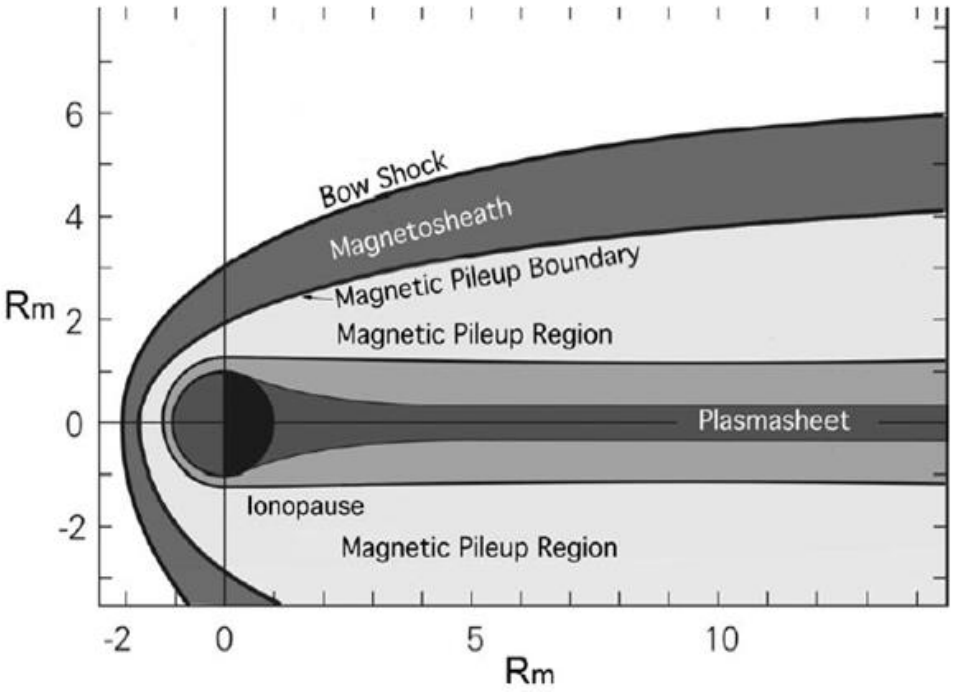
2.1.1 The induced Magnetosphere of Mars

Near the Mars orbit, according to the Archimedean spiral model for the IMF, this should have typically an angle of 56º from the Mars-Sun line considering a magnitude of 3 nT (LUHMANN et al., 1992). In that region the solar wind is perturbed by the passage of interplanetary shock waves and Coronal Mass Ejections (CMEs), and consequently the planet can be reached by ion and energetic electron flows, which are associated to these shock waves or to solar flares. With the absence of an intrinsic magnetic field, the planet cannot deflect totally the high energy particles and some of them can penetrate in the atmosphere of Mars (LUHMANN et al., 1992; LUHMANN et al., 2004). Due to the interaction of the solar wind with heavy ions, constantly produced in the magnetospheric plasma, different plasma boundaries are created, where the position of these boundaries depends on the ionospheric ion production ratio, the solar wind pressure and the electron temperature (BOESSWETTER, et al., 2004).

The boundaries developed in the formation of the induced Mars magnetosphere are: the bow shock, the Magnetic Pileup Boundary (MPB) and the ionopause. Those boundaries are responsible for the separation of the plasma environments that exist near Mars, such as the magnetosheath and Magnetic

Pileup Region (MPR). Figure 2.1 shows a scheme of the Mars magnetosphere where the plasma boundaries are indicated.

Figure 2.1- Scheme of the Mars magnetosphere with its plasma boundaries and regions indicated.



Source: Nagy et al. (2004).

The characteristics of each plasma boundary and region of the Martian magnetosphere are presented in the next subsections.

2.1.1.1 Bow Shock (BS)

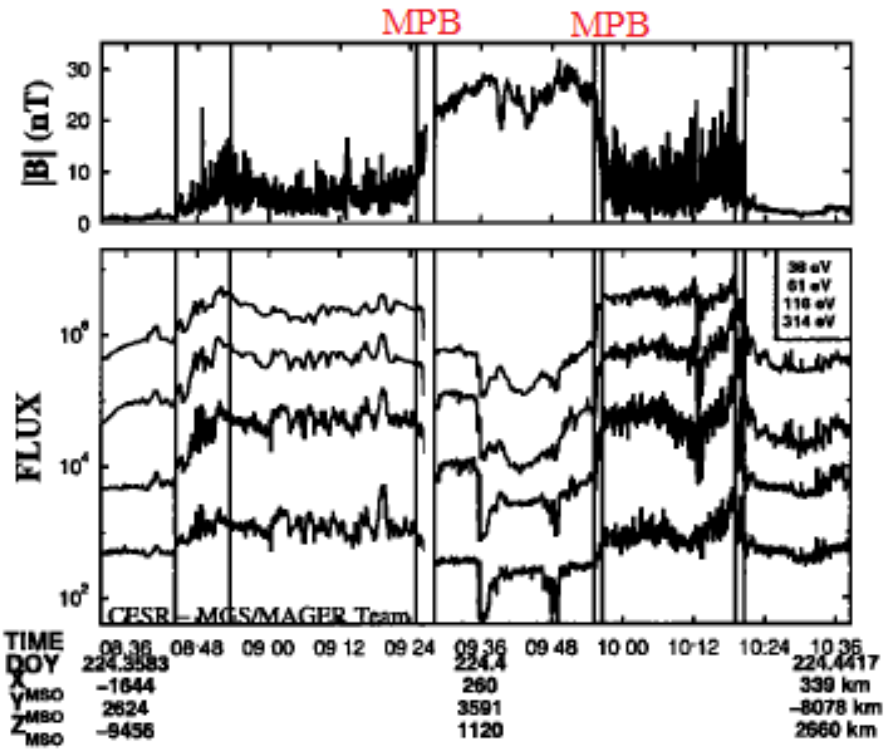
At the subsolar point, the bow shock at Mars is formed at approximately 1.58 Mars radius (R_m = 3390 km) from the center of the planet (VIGNES et al., 2000); at the terminator it forms at approximately 2.8R_m. The location of the bow shock is asymmetric, and the boundary is observed further from the planet in the south hemisphere than in the north hemisphere. A possible explanation of that asymmetry is the fact that the crustal magnetic fields are more intense in the south hemisphere, pushing the bow shock farther away from the planet (MA et al., 2008).

2.1.1.2 Magnetic pile-up boundary (MPB)

The MPB is a clear boundary, which is characterized by drops in the magnetic field fluctuations, with variations by a factor between 2 and 3 in its intensity and a strong electron flux decrease (ACUÑA et al.; 1998; VIGNES et al., 2000; DUBININ et al., 2007).

Figure 2.2 presents magnetic field (first panel) and the electron flux (second panel) data near Mars. In the upper panel it can be noticed the decrease in the fluctuations and an increase in the magnetic field intensity in the region between 9:24 UT and 10:00 UT, identified as the MPB. In that region, drops in the electron flux can also be observed in the second panel. The data were obtained by the magnetometer and electron reflectometer (MAG/ER) on board the Mars Global Surveyor (MGS) (VIGNES et al., 2000).

Figure 2.2- Magnetic field (upper panel) and electron flux (bottom panel) data from MGS, August 12, 1998.



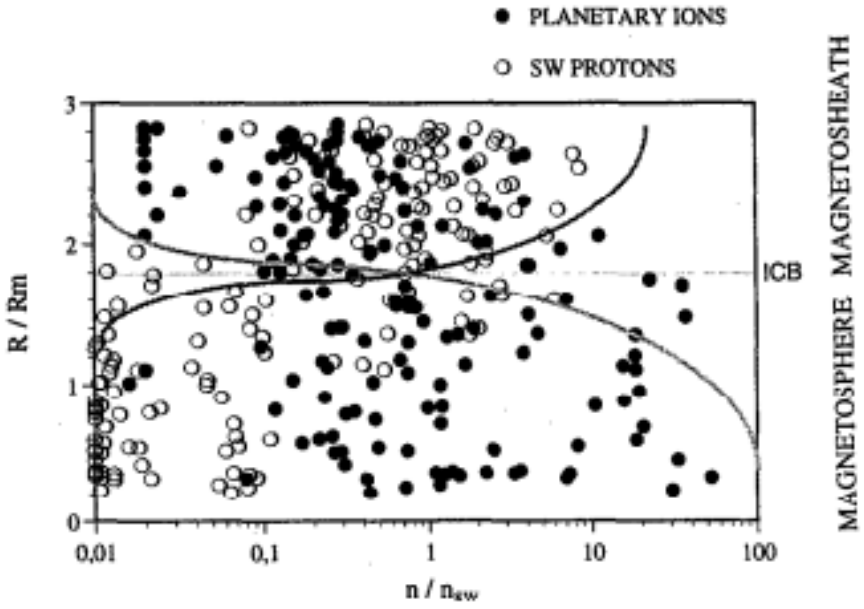
Source: Vignes et al. (2000).

2.1.1.3 Ion composition boundary (ICB)

Atoms from the neutral atmosphere of Mars can be ionized and involved in the solar wind flux. This process is called as mass loading and is characterized by the ionized rate showing dependence with the solar cycle (ERKAEV et al., 2007). Heavy ions that suffer that process create a dense layer between the bow shock and the ionopause. That boundary is called the Ion Composition Boundary (ICB). The name of that boundary is justified by the fact that it is found in the transition zone between the regions mainly dominated by solar wind protons (magnetosheath), and a region filled by heavy ions (DUBININ et al., 1997). In that region, planetary ions dominate and the proton density drop is proportional to the increase of planetary ions (BREUS et al., 1991).

Figure 2.3 presents the solar wind proton and planetary ion distribution in the Martian magnetosheath with Phobos-2 observations, where the ICB locations are indicated by the dashed line.

Figure 2.3- Solar wind proton (open circles) and planetary ion (solid circles) distribution in a cylindrical reference frame, $R = (Y^2 + Z^2)$, and Y and Z are coordinates of the spacecraft in MSO (Mars Solar Orbital) reference frame.



.

Planetary ions are represented by full circles and solar wind protons by open circles. Source: Dubinin et al. (1997).

The ICB is found close to the location of the MPB. Thus, it can be said that the MPB and the ICB form a boundary to the solar wind plasma (BOESSWETTER et al., 2004; LUNDIN et al., 2006).

2.1.1.4 Magnetosheath

Between the bow shock and the MPB, the magnetosheath is found. The magnetosheath is a region of high density and elevated temperature due to the solar wind plasma compression and heating (LUHMANN et al., 1992). The Mars magnetosheath is mainly filled by protons and alpha particles, although planetary ions are not restricted to the inner magnetosphere, where they dominate (DUBININ et al., 1997; SAUER et al., 1998). This occurs because planetary bodies, as Mars and Venus, show an extended exosphere, and consequently, planetary heavy ions can modify the ion global dynamics in the magnetosheath (NAGY et al., 2004). Heavy planetary ions, as O^+, can have a gyroradius bigger than the diameter of Mars and their trajectory can reach the lower atmosphere, where they are absorbed or can escape from the planet in direction of the magnetotail (CLOUTIER et al., 1973; LUHMANN et al., 1992).

2.1.1.5 Photoelectron boundary (Ionopause)

The Photoelectron Boundary (PEB) receives that name because it is characterized by photoelectrons that are produced by photons from ultraviolet radiation and soft x-rays of solar origin, which reach the lower regions of the Martian atmosphere (MITCHELL et al., 2001; BRAIN, 2006; MA et al., 2008; DIÉVAL et al., 2011). The PEB separates the magnetic pile up region (MPR), which is found below the MPB and the ionosphere of Mars. As the MPB, the location of the PEB depends on the solar wind parameters, as the extreme ultraviolet radiation and solar wind pressure, and of the magnetic crustal fields (MITCHELL et al., 2001).

2.1.1.6 Magnetic Pile up Region (MPR)

As mentioned before, the MPR is located between the MPB and the PEB. It is characterized as a region with strong magnetic fields and high organization, which is result of the IMF being dragged and piled up around the ionosphere of Mars (NAGY et al, 2004; MA et al., 2008). In that region, the electron population

is a mixture of solar wind electrons and photoelectrons. Solar wind protons and He^{++} ions are excluded of the MPR, where planetary ions are predominant (TROTIGNON et al., 2006).

The MPR extends to the night side of Mars and forms the induced magnetotail lobes (BERTUCCI et al., 2005).

2.1.1.7 Induced Magnetotail of Mars

With the extension of the MPB to the nightside, the lobes of the magnetotail are formed. In the center of the tail, a plasmasheet is found, where high density hot plasma and accelerated planetary ions of several keV of energy can be observed (LUNDIN et al., 1990; LUNDIN; BARABASH, 2004; BRAIN, 2006). Above the plasmasheet, a current sheet is found, which divides the magnetotail in two lobes. The lobes of the magnetotail of an induced magnetosphere present their magnetic field lines in opposite orientation, which varies with the IMF orientation, since the tail is formed by the IMF lines that are dragged around the planet (SCHWINGENSCHUH, et al., 1992).

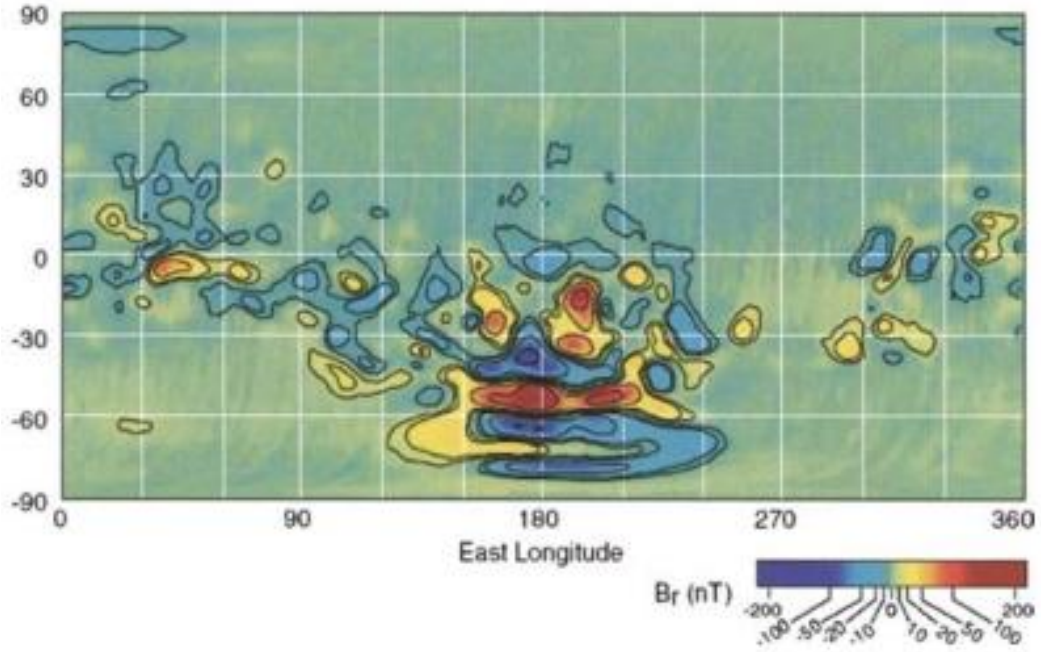
In the Mars magnetotail, both, planetary and solar wind plasmas are found, where in the interior of the magnetotail, planetary plasma becomes dominant (LUNDIN; BARABASH, 2004). This indicates that the induced magnetic field creates a kind of protection for the planet against the solar wind penetration, which cannot be observed in the dayside of Mars (LUNDIN et al., 2006). The global form and the length of magnetotail do not depend only on the IMF, but also on the ionized gas volume around the planet (LUNDIN; BARABASH, 2004).

2.1.1.8 Crustal Magnetic Fields

After the observation of magnetic field and plasma near Mars by the Phobos-2 spacecraft, questioning about a presence of Mars intrinsic magnetic field arises (LUHMANN et al., 1992; ACUÑA et al., 1998; 1999). Later, it was verified that Mars had a magnetic dipole, but it ceased about 4 billion years ago. (LUHMANN et al., 1992).

Magnetic anomalies have been observed on the Mars crust by the MAG/ER experiment onboard MGS, when magnetic signatures in located regions of Mars in an altitude between 100 and 200 km were identified (ACUÑA et al., 1998). Closer to 100 km altitude, crustal magnetic fields on the order of 1600 nT have been observed. This value has been found in the south hemisphere region, located between 120º W and 210ºW, and between 30ºS and 85ºS (ACUÑA et al., 1999; BRAIN, 2006). Figure 2.4 shows the Mars crustal magnetic field mapping, by which it is noticed that it is more intense in that region in the south hemisphere.

Figure 2.4- Map of the Mars crustal magnetic field based in MAG/ER-MGS data.



Source: Brain (2006).

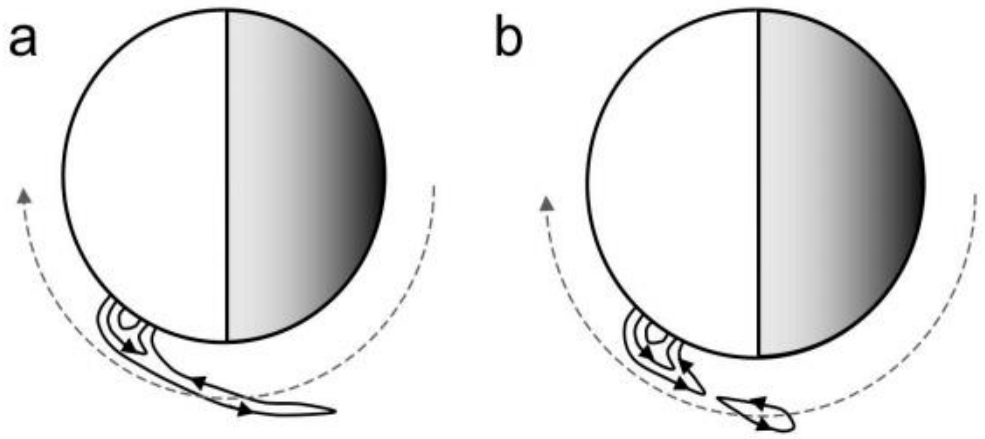
Those magnetic anomalies are associated with a magma rich in iron in the Martian crust (ACUÑA et al., 1998). The magnetized crust rich in iron had been formed and cooled several hundred million years ago, due to an intensification of the Mars magnetic field, before it ceased (ACUÑA et al., 1999; ACUÑA et al., 2001).

The crustal magnetic field lines in the dayside can extend in the tail direction by the interaction with the solar wind. The magnetic field lines can be connected to

the planet, or they can be isolated from it, like plasmoides in the Earth's magnetotail. However, as the crustal magnetic field lines are stretched far away from the planet in the magnetotail direction, they form a thin current sheet, which probably will be reconnected and then disconnected from the planet. The ionospheric plasma in the inner structure will be carried away from the planet in a bulk removal process (BRAIN et al., 2010).

In Figure 2.5 an example of that process is presented, where two steps are shown: the magnetic field lines stretched tailward, and the plasmoids formation, where the lines reconnecting one another and isolating themselves from the planet.

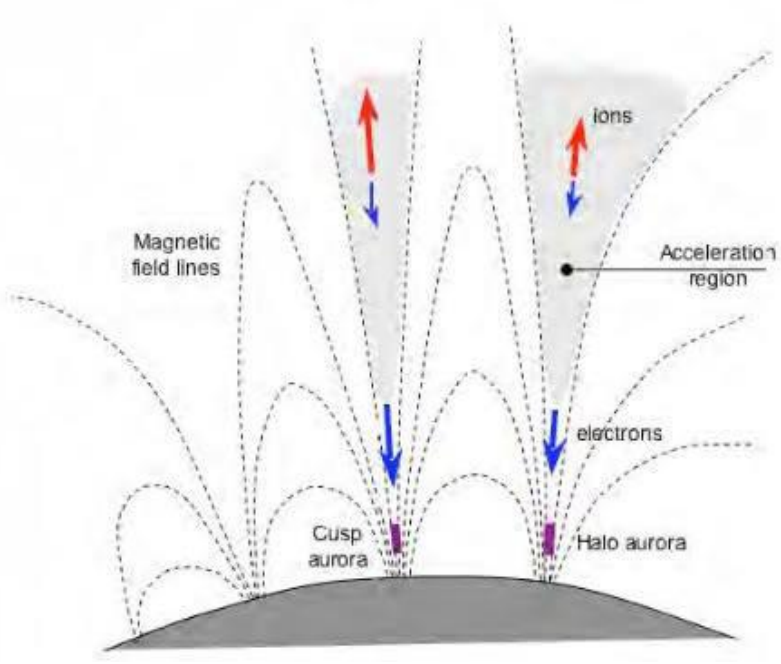
Figure 2.5- Illustration of the Mars crustal magnetic field lines being stretched tailward (a), and forming the loops of the crustal magnetic field which are disconnected of the planet carrying ionospheric plasma away b).



Source: Brain et al. (2010).

The magnetic anomalies are not able to affect the global interaction between the solar wind and Mars, but in the region of anomalies, multiple cusps can be formed, where magnetic reconnection between the magnetic field of the anomalies and the IMF occur. Through the cusps, electrons from the solar wind can enter into the Martian magnetosphere (ACUÑA et al., 1999). Figure 2.6 shows the illustration of the magnetic cusps formation in the magnetized crust of Mars.

Figure 2.6- Illustration of the multiple cusps in the crustal magnetic field of Mars.



Source: Stefan (2008).

The spectroscopy for the investigation of the characteristics of the atmosphere of Mars (SPICAM) instrument onboard of the Mars Express identified auroras in the region of the cusps of the magnetic anomalies of Mars, formed due to particle precipitation. Thus, the Martian auroras are highly concentrated and the location of the emissions is controlled by the magnetic field of the crustal anomalies (BERTAUX et al., 2005).

2.1.2 The induced Magnetosphere of Venus

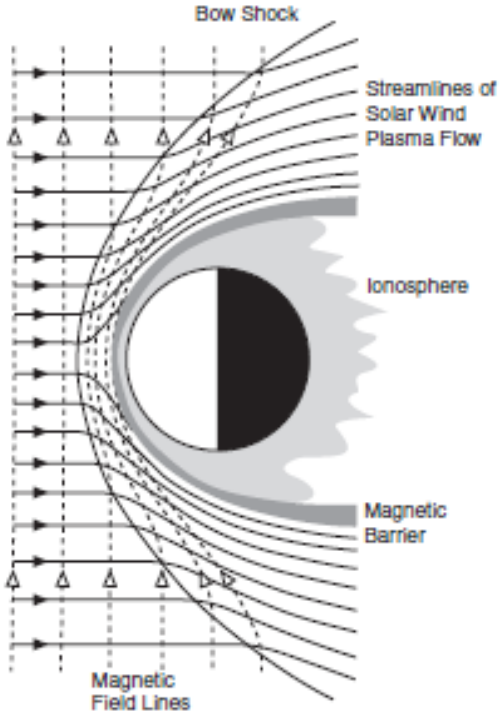
Due to the interaction of the supermagnetosonic solar wind with the ionosphere of Venus, a bow shock is formed in front of the induced magnetosphere of Venus (LUHMANN, 1986). Although Venus and Earth have a similar size, the Earth's bow shock is much larger than the Venusian bow shock (SLAVIN et al., 1979). This occurs because the location and shape of the bow shock depend on the nature of the interaction between the solar wind and the size and shape of the obstacle (CHAI et al., 2015). Planets with a strong magnetic field will have the bow shock more distant from it. On the other hand, planets that do not have an intrinsic magnetic field, as Mars and Venus, have their bow shock located

closer to them (SCHWINGENSCHUH, et al., 1990). The location of the bow shock also depends on the propagation speed of the plasma waves (CHAI et al., 2015).

2.1.2.1 Regions of the induced magnetosphere of Venus

As occurs in the Mars magnetosphere, boundaries and plasma regions are similarly formed in the Venusian induced magnetosphere. Figure 2.7 shows an illustration of the Venus induced magnetosphere with its regions and boundaries named.

Figure 2.7 Scheme of the induced magnetosphere of Venus.



Source: Zhang et al. (1991).

In the next subsections, those plasma boundaries and regions will be presented.

2.1.2.1.1 Magnetosheath

As it is observed in other magnetospheres, below the bow shock, the magnetosheath is formed (LUHMANN et al., 1992). In that region the solar wind is compressed and protons dominate (LUHMANN et al., 1986).

2.1.2.1.2 Magnetic Barrier

Through observations of the Pioneer Venus Orbiter (PVO) spacecraft the “pile-up” of the magnetic field around the region below the dayside of the magnetosheath has been observed, forming the called Magnetic Barrier (MB) (RUSSELL et al., 1979). In the MB region, the magnetic pressure dominates all the others contributions of pressure. That region is related to the momentum transfer from the solar wind into the ionosphere via increase of the magnetic pressure (ZHANG et al., 1991). The upper limit of the MB was observed by Bertucci et al. (2003), and it is known as the MPB. The MPB, as mentioned in the previous section, was observed first in Mars, above the MPR. That region in Mars corresponds to the MB of Venus, region where the observed magnetic field shows high organization and intensity (NAGY, 2004).

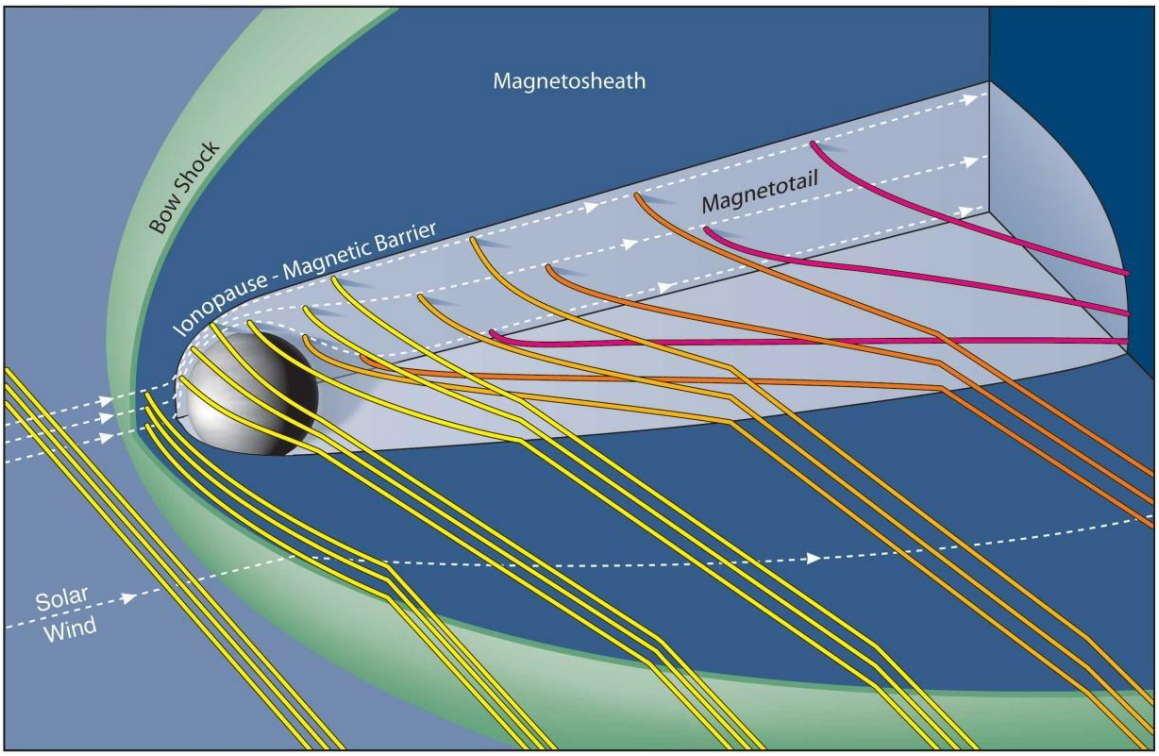
2.1.2.1.3 Ionopause

The ionopause can be defined as the top of the ionosphere, and it is formed where the magnetosheath magnetic pressure is balanced by the ionospheric thermal pressure (PHILLIPS et al., 1985; MAHAJAN, 1995). At the subsolar point the Venusian ionopause is formed at about 200 km of altitude and in the terminator region at 400 km. The location of the ionopause varies with the solar wind dynamic pressure (SWP), extreme ultra violet (EUV) radiation and the solar zenith angle (SZA) (RUSSELL et al., 2006).

2.1.2.1.4 Magnetotail

As it was said in the Mars magnetosphere section, the magnetotails of induced magnetospheres are formed by the slipping of the IMF lines around the body (VAISBERG; ZELENY, 1984). In Figure 2.8 the formation of the induced magnetotail of the Venusian magnetosphere is shown.

Figure 2.8- Illustration of the induced magnetotail of Venus.



Source: Saunders; Russell (1986).

In the center of the magnetotail the current sheet is observed, where the magnetic polarity reversal occurs, which divides the tail in two lobes (DAS, 1998). The current peak occurs in the center of the tail, with a maximum intensity of 1.5 nA/m^2 (RUSSELL et al., 2006). Again, as it is an induced magnetotail, the orientation of the magnetic field lines in the lobes varies with the solar wind orientation (DAS, 1998). It is important to notice that when the magnetic field lines are near the planet, the flow moves slowly, whereas at their ends, the plasma flow travels at the solar wind velocity (RUSSEL et al., 2006).

2.2 ULF waves

Ultra-Low Frequency waves are characterized as fluctuations in the plasma or magnetic field that present frequencies below the dominant local ion gyrofrequency (KIVELSON, 1995), which is defined as below than 30 Hz (HUBA, 2013). ULF waves are considered as an essential factor in the magnetospheric physics. Those waves carry information about instabilities, free

energy configuration contained in the plasma or in the obstacles to the flow. Further, ULF waves transport energy between different parts of the magnetospheric system (GLASSMIER; ESPLEY, 2006).

ULF waves are also present in the phenomenology of wave-particle interactions, where they can be considered the cause or the effect. Particle thermalization, particle energization and wave generation can be caused by the involvement of those waves (GREENSTADT et al., 1995).

2.2.1 Waves in the solar wind near planets

ULF waves can be observed from the chromosphere and photosphere of the Sun to planetary surfaces (POTAPOV, 2013). Magnetospheric ULF wave power can be controlled by the solar wind variability, where the solar wind speed is considered a crucial parameter that governs the ULF power (GREENSTADT et al., 1979; POKHOTELOV et al., 2015).

The foreshock is formed by electrons and ions being reflected at the bow shock and back streaming against the solar wind. That region can be an important source of ULF waves. ULF waves are observed in the foreshock due to energized particles of the solar wind, which gets the energy due to multiple crossings of the bow shock and escape to the upstream region creating instabilities in the foreshock's plasma and also, due to magnetosheath ions that escape across the bow shock and move in the anti-solar region (RUSSELL et al., 1990; DELVA; DUBININ, 1998; VOLWERK, 2008).

Low Frequency (LF) and ULF waves produced due those backstream interactions can be observed in different regions of the foreshock. Reflected ions occur more frequently in the quasi-perpendicular region of the bow shock, and the escaped ions dominate the quasi-parallel region (DELVA; DUBININ, 1998).

2.2.2 Wave Modes

Four propagating wave modes are studied in this thesis, the magnetohydrodynamics (MHD) wave modes: slow mode, intermediated mode (Alfven) and fast mode, and also the mirror mode. These dominate the ion

physics in solar wind plasma because the frequency range is close to the ion gyro frequencies. In the MHD theory, slow and fast wave modes dominate the compressional component, whereas Alfven waves are dominated by the incompressible component. The MHD modes can be distinguished by the correlation between the density and parallel magnetic field fluctuations. For Alfven mode, the density and the parallel magnetic field fluctuations are both zero, for fast waves they are positively correlated and for slow waves a negative correlation is observed (HOWES et al., 2012).

Slow and fast modes present longitudinal and transverse components and they are generated in situations where in a first moment the magnetic field and plasma oscillations are in phase and later they are out of phase. These wave modes can steepen and form shocks (PARKS, 2004). Slow mode waves cannot propagate across the magnetic field, and are associated with an increase in entropy (BAUMJOHANN; TREUMANN, 2012).

In the fast wave mode, the energy can be propagated and transported isotropically (WRIGHT; MANN, 2006). Those compressional waves can transfer energy from one region of the plasma to another, propagating across the field lines (TAKAHASHI et al., 2006). In the solar corona, the fast mode can propagate in any direction relative to the background magnetic field. In the expanding solar wind plasma, the fast mode can interact with it by wave dissipation adding heat to the plasma. Also variations in wave pressure produce a force on the plasma, and consequently add momentum to the flow (FLA et al., 1984). In the Earth's magnetosphere, transit-time damping of fast mode has been associated as an important role in generating increases of relativistic electrons during major geomagnetic storms (SUMMERS; MA, 2000).

Alfven mode waves are transversal electromagnetic waves, which transport energy and present the propagation vector in the direction of the background field (BELCHER; DAVIS, 1971; WRIGHT; MANN, 2006). While the wave magnitude varies, the plasma density and the total magnetic field are kept constant. One characteristic of Alfven waves is that variations in the magnetic field are correlated with perturbations in the solar wind velocity (PARKS, 2004).

Alfven waves show in general, elliptical polarization at low frequencies and have the left-hand and right-hand components dominated by the ion inertia. The linear polarization can be observed in Alfven waves when the two oppositely polarized modes have almost equal amplitude. Alfven waves in the solar wind in interplanetary medium have their source associated to the processes of heating in the solar corona. These waves in the solar wind are observed having larges amplitudes in the high speed streams (HSS) (PARKS, 2004). In the Earth's magnetosphere, those waves are related to a kind of auroral activity, High-Intensity Long Duration Continuous AE Activity (HILDCAAs) that transfer energy from the solar wind into the inner magnetosphere (TSURUTANI et al., 2006; SOUZA et al., 2016).

Mirror mode oscillations can be caused by temperature anisotropies. In this kind of wave mode, the largest growth rate of the oscillations is observed for wave vectors perpendicular to the background magnetic field (TSURUTANI et al., 2011; RUHUNUSIRI et al., 2015a). Mirror modes are typically linearly polarized, more compressional than the transversal, and show anti-correlations between the magnetic field and the plasma density. Mirror mode has been observed in many planetary magnetosheath: Earth (KAUFMANN et al., 1970, OSMANE et al., 2015), Venus (VOLWERK et al., 2008), Jupiter (TSURUTANI et al., 1993), Saturn (CATTANEO et al., 1998), Uranus (RUSSELL et al., 1989) and in the dayside of the Martian magnetosheath (ESPLEY et al., 2004). The source of the temperature anisotropy in a planetary magnetosphere is provided by the heating at the bow shock (KULSRUD, 2005).

The wave modes and a method to identify them are described better in section three of this thesis.

2.2.3 Waves in planetary magnetospheres

ULF waves have been observed in many magnetospheres of the planets of our solar system (KHURANA; KIVELSON, 1989; KHURANA; KILVELSON, 1994; VELLANTE et al., 2002; GLASSMEIER; ESPLEY, 2006; ESPLEY et al., 2004; ECHER, 2010; FRAENZ et al., 2017).

Studies developed about the magnetosphere of Earth show that many mechanisms can generate ULF waves, such as, processes in the magnetotail due to substorms, kinetic instabilities in the inner magnetosphere and also, the interaction between the solar wind and the magnetosphere (TAKAHASHI et al., 2006). ULF waves generated in the interaction between the solar wind and the terrestrial magnetosphere present frequencies in the magnetosheath between 1-100 mHz, which propagate toward the ionosphere where they can be partially reflected (SCIFFER et al., 2004). In the region of the Earth's foreshock, ULF waves can be divided into 3 types: waves with high amplitude and low frequency, with periods of 30 seconds (whistler waves of 1- Hz) and waves of 3 seconds. The source of the waves with periods of 30 seconds is associated to ions that propagate in the upstream direction of the bow shock (GREENSTADT et al., 1995).

2.2.3.1 Waves in induced magnetospheres

ULF waves present special features in induced magnetospheres (GLASSMEIER; ESPLEY, 2006). In our solar system, induced magnetospheres are observed in the planets Mars, Venus and the Saturn Moon, Titan (KIVELSON; RUSSELL, 2007). In this thesis the study of ULF waves was developed for the induced magnetospheres of Mars and Venus, and a brief revision of previous works of ULF waves in these magnetospheres is presented below.

2.2.3.1.1 LF and ULF waves at Mars

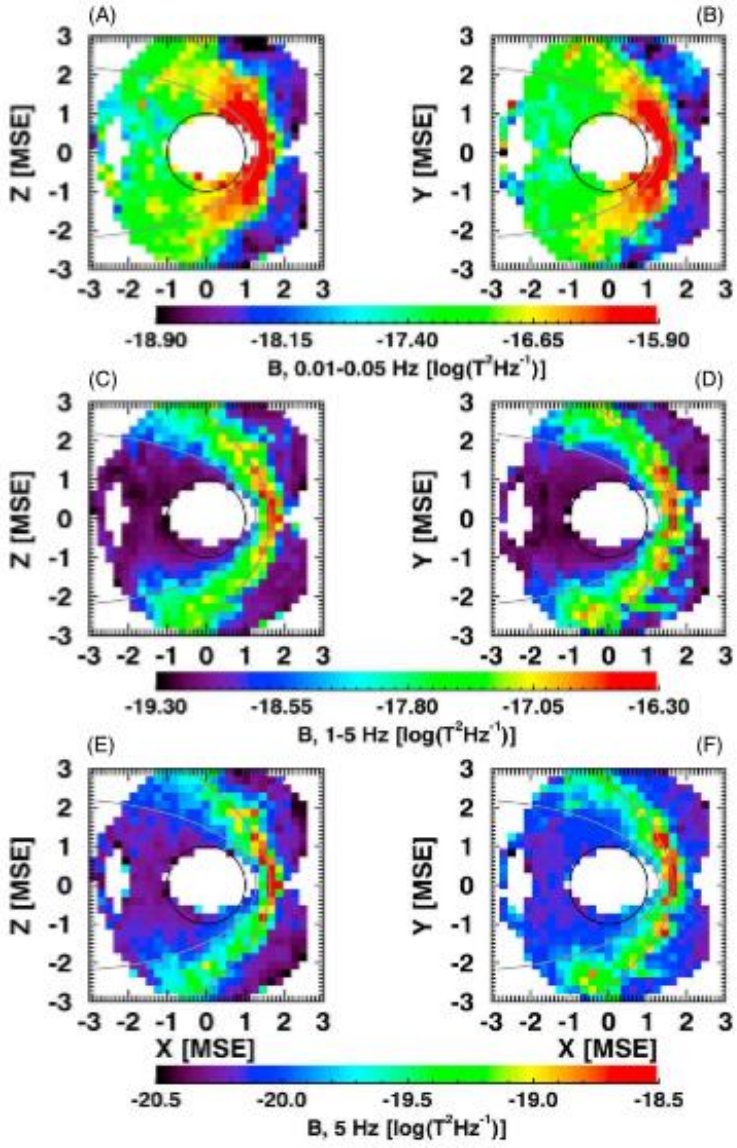
LF waves were observed for the first time in the plasma environment of Mars through measurements of the plasma wave system experiment operated by the Phobos-2 spacecraft (SAGDEEY; ZAKHAROV, 1989). Plasma waves that are generated at the boundaries layers, such as Alfven waves, fast mode and electromagnetic ion cyclotron waves, can be considered the most important for carrying energy over extended distances (ERGUN et al., 2006).

Russell et al. (1990) studied waves with frequencies below 0.5 Hz at the upstream region of Mars using Phobos spacecraft measurements. Waves at the proton gyrofrequency are observed in that region. The source of these waves

can be ionized hydrogen from the exosphere via ionization by solar wind electrons, photoionization or charge exchange.

Fowler et al. (2017) studied the wave power in the electric and magnetic field at Mars for several frequency ranges (ULF: 0.01-0.05 Hz; LF: 1-5 Hz; medium frequencies: 5 Hz and high frequency: 1 kHz-5 kHz) using data from the MAVEN mission.

Figure 2.9- Statistical maps for the wave power of the magnetic field for different frequency bands.



Source: Fowler et al. (2017).

In Figure 2.9 statistical maps with the magnetic field wave power for altitudes higher than 600 km for all frequency bands described above (except for high frequency) are shown. Where: 2.9-a) and 2.9-b) show ULF in the z and y plans, respectively. 2.9-c) LF (Z), 2.9-d) LF (Y) and 2.9-e) and 2.9-f) for medium frequency.

Fowler et al. (2017) show that high wave power is observed in the range with lower frequencies. From the maps presented in Figure 2.9 it is possible to observe the plasma boundaries and environments, showing the regions where the solar wind energy dissipation in the Martian magnetosphere is more important. High wave powers are observed in figures 2.9-a) and 2.9-b), where the wave power in the ULF range is presented, mainly in the magnetosheath.

As a significant part of the study developed in this thesis are referring to the plasma oscillations in the magnetosheath of Mars, a subsection about ULF waves in that region it is presented.

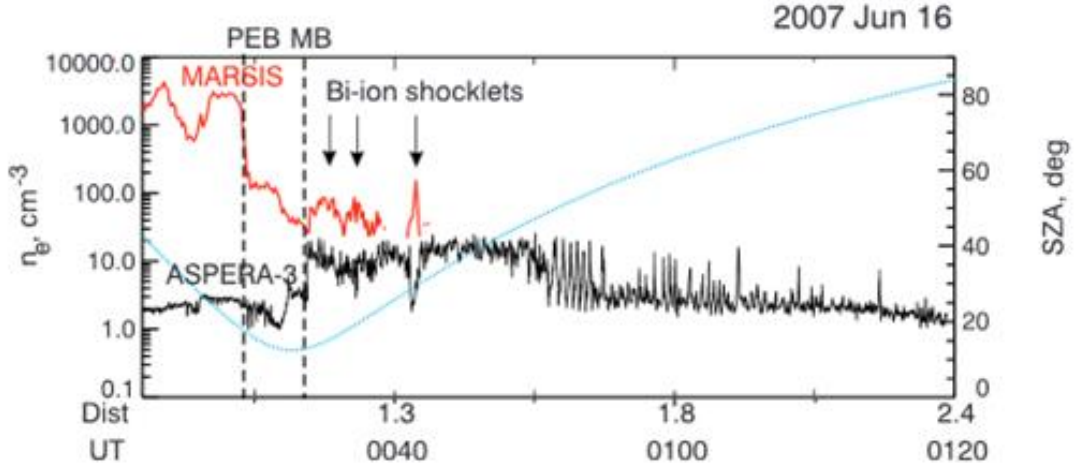
2.2.3.1.1.1 ULF waves in the magnetosheath of Mars

The Martian magnetosheath is filled by compressional MHD waves. The interaction between the solar wind and heavy ions of the planetary plasma results in the generation of strong MHD bi-ion waves (DUBININ et al., 1998). These waves are related to the exchange of periodic momentum between the proton flux and heavy ions. They can be intensified and produce multiple shocklets (DUBININ et al., 1997; NAGY et al., 2004). Sauer et al. (1988) observed an oscillation characteristic of the dynamical exchange between the proton and heavy ions in the magnetosheath of Mars. It was also observed that non-linear MHD bi-ion waves can evolve to several shocks.

An interesting characteristic of that kind of shocks which generates bi-ion waves is the deceleration and compression of heavy ions, which can occur with the acceleration and rarefaction of the protons. Figure 2.10 shows an example of observations on July 12, 2007, where it is possible to see the electron numerical density measured by ASPERA-3/Mars Express (red curve shows the solar wind hot electrons density) and by MARSIS (the black curve shows electrons from

the planetary plasma), respectively. Jumps of the planetary plasma density can be observed by MARSIS in the magnetosheath (00:35 UT, 00:37 UT and 00:41 UT), which are followed by rarefactions in the solar wind plasma, measured by the ASPERA-3 instrument. The different behavior of the solar wind and the planetary plasma is a possible manifestation of the bi-ions effects; those are indicated in the figure with black arrows.

Figure 2.10- Numerical electron density provided by MARSIS and ASPERA-3.



Source: Adapted from Dubinin et al. (2008).

Espley et al., (2004) studied low frequency waves in the plasma regions of the induced magnetosphere of Mars (magnetosheath, MPR and magnetotail). Through observations of the MAG/ER instrument onboard of the MGS, compressional oscillations, elliptically polarized waves were observed at the dayside of the magnetosheath. The wave vector presented an angle higher than 60º in relation to the mean magnetic field. Such oscillations presented dominant frequencies significantly lower than the proton gyrofrequency in the magnetosheath. Those oscillations were identified as mirror modes.

Ruhunusiri et al. (2015a), using data from the ion analyzer and from the magnetometer of the Mars Atmosphere and Volatile Evolution (MAVEN) mission characterized low frequency waves in the Mars magnetosphere through

the analyses of the transport ratios. They observed that Alfven and fast modes are more common than the mirror modes in the magnetosheath. They also observed that slow modes occurred less frequently than the others.

Winningham et al. (2006) also studied low frequency waves in different regions of the Martian magnetosphere, such as: the magnetosheath, magnetotail and magnetic cusps. The analysis was done using electron oscillation data obtained from observations of the electron spectrometer of the ASPERA-3. In the magnetosheath, oscillations in the electron flux present frequency peak between 0.01 and 0.02 Hz, which corresponds to the oxygen gyrofrequency in that region. Their results also suggest that the bow shock may be the source of those oscillations, although it was observed that the magnetosheath and the magnetosphere night side also respond to those oscillations.

In the nightside magnetosheath the oscillations are more variable and sometimes present circular polarization, but in general they are transversal and the magnetic perturbations are left-hand elliptically polarized (as well as some regions in the dayside of the magnetosphere) (ESPLEY et al., 2004). The waves propagate at smaller angle (less than 30º) relative to the mean magnetic field. Those oscillations present variable frequencies. The main frequencies observed are with a factor of 2 (0.2-0.004 Hz) less than the local proton gyrofrequency, but it is possible that they exceed the proton gyrofrequency.

It is believed that the oscillations observed in the nightside magnetosheath can be produced by picked-up cold ions newly produced due to the interaction between protons from the solar wind and the Martian exosphere (ESPLEY et al., 2004).

2.2.3.1.2 LF and ULF waves at Venus

ULF waves at Venus were observed first by the spacecraft Mariner-10 (GREENSTADT, 1970), ULF waves have been observed in the upstream region, magnetosheath and also in the Venusian ionosphere by the magnetometer of the Pioneer Venus Orbiter (GLASSMEIER; ESPLEY, 2006). It is assumed that those waves are generated in the vicinity of the bow shock by energized and reflected electrons at that boundary and are transported into

regions below the bow shock with the turbulent flux of the magnetosheath (GUICKING, 2010). Thus, in the magnetosheath, those waves are more intense, once that there are many sources that can nourish them, such as waves generated at the bow shock, local instabilities, etc. (DUBININ; FRAENZ, 2016; FRAENZ et al., 2017).

Quasi-monochromatic ULF waves have been identified in the ion foreshock of Venus with magnetic field observations and the excitation of these waves are associated to the foreshock backstreaming ions (SHAN et al., 2016). The spatial distribution of low-frequency magnetic field oscillations at Venus and its solar wind interaction region has been performed by Guicking et al. (2010), in that study, it was concluded that the spatial distribution of waves in Venus is similar to the distribution observed at Mars, an enhancement in the intensity in the dayside magnetosheath was detected by them, and also a strong decrease toward the terminator.

Oscillations that start below the bow shock can keep propagating through the magnetosheath until the magnetic barrier (POPE et al., 2009). ULF wave modes around Venus were studied by us and reported in Fraenz et al. (2017). There we observed that Alfven waves are dominant in the solar wind and in the magnetosheath, but near the magnetic barrier, there is a high occurrence of fast mode, which may indicate transference of energy from those waves by compression to the upper ionosphere, located below the magnetic barrier.

3 INSTRUMENTATION AND METHODOLOGY

In order to develop this thesis work on Mars ULF waves, plasma data obtained through the Electron Spectrometer (ELS) and the Ion Mass Analyzer (IMA) of the Analyzer of Space Plasma and Energetic Atoms (ASPERA-3) instrument have been used. In addition, we also have used data of the derived magnetic field strength from the Mars Advanced Radar for Subsurface and Ionosphere Sounding (MARSIS) for the wave penetration analysis. Both instruments are onboard of the Mars Express (MEX) spacecraft (BARABASH et al., 2004; PICARD et al., 2004, FRAENZ et al., 2006, ANDREWS et al., 2013).

To study the temporal and spatial scales on which plasmas are correlated around Mars, data from the magnetometer (MAG) and the solar wind electron analyzer (SWEA) onboard of the MAVEN spacecraft have been used as well (JAKOSKY et al., 2015).

For the study of ULF waves on Venus, data from the ELS of the ASPERA-4 experiment and from the magnetometer (MAG), both onboard of the mission Venus Express (VEX), have been used (BARABASH et al., 2006).

All data used were obtained by contact with MPS (Max Planck Institute For Solar System Research) plasma group.

A brief introduction of these spacecraft and instruments used in this thesis is shown below. Many parts of the studies developed in this thesis have used the CCATI software, which is described in the following. The wavelet technique, the correlation length analysis and wave mode identification method were used in this work, and are also described in this section.

3.1 Spacecraft / Instrumentation

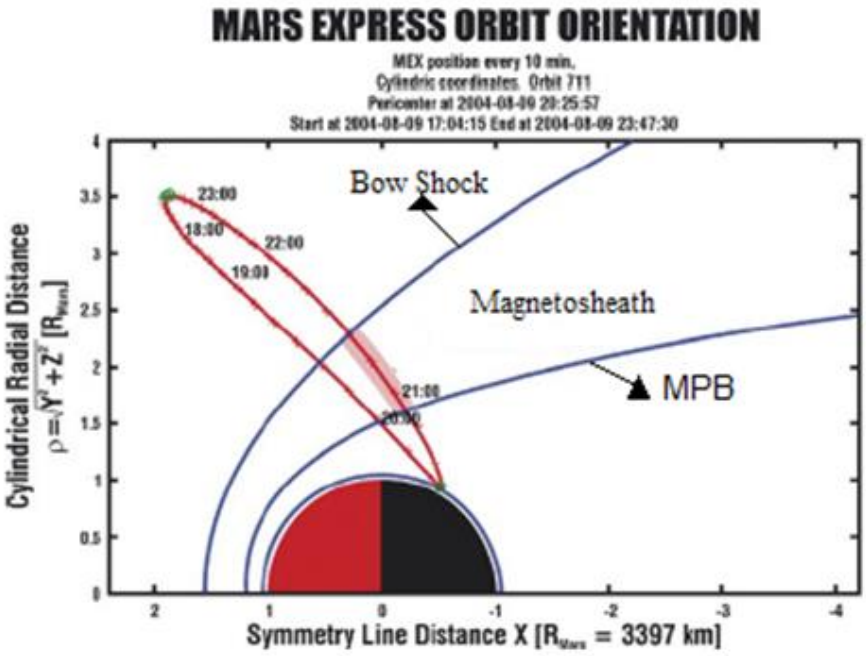
3.1.1 Mars Express

The MEX was launched by the European Space Agency (ESA) in the beginning of July 2003 and it has arrived at Mars in December of the same year. It is still operating in orbit around the planet at the time of this thesis (October/2018). The MEX orbit has an elliptical trajectory around Mars, with an inclination of 86.35º and a period of about 6.75 hours. This eccentric elliptical orbit has an

altitude of about 250 km at the periapsis and 10142 km at the apoapsis (CHICARRO et al., 2004).

Figure 3.1 shows one example of the MEX orbit (red) on 9 August 2004. The region marked in pink represents the interval where the spacecraft crossed the magnetosheath. The figure presents the orbit using Mars Solar Orbital (MSO) coordinate system. The Mars-Sun line is defined as the +x direction and is centered in Mars, y points backward along the tangent of the planetary orbit, and z completes the right-handed set pointing upward from the plane of the ecliptic into the northern hemisphere. In Figure 3.1, the Y-axis represents the cylindrical radial distance $\rho = \sqrt{{Y_{MSO}}^2 + {Z_{MSO}}^2}$.

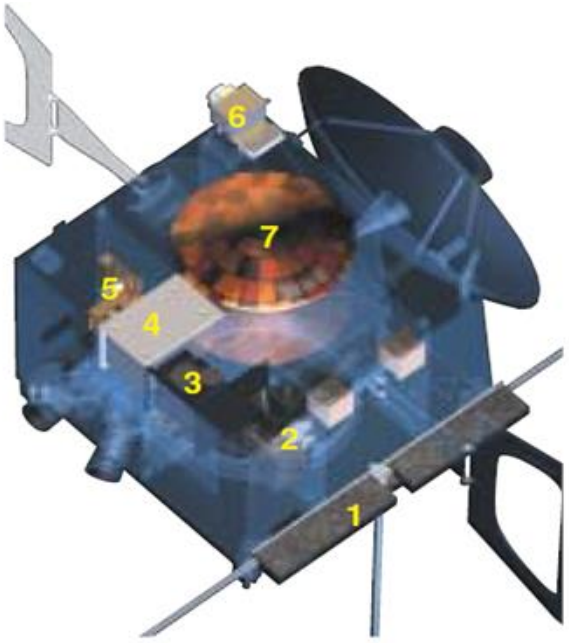
Figure 3.1 – MEX orbit (red) on 9 August 2004 in cylindrical coordinates.



Source: Adapted from Winningham et al. (2006).

The main objective of the MEX mission is to study the interaction between the solar wind and Mars, its atmosphere, surface and subsurface. The MEX spacecraft operates with 7 instruments, which provide information on the atmosphere, ionosphere, surface and interior (CHICARRO et al., 2004). Figure 3.2 shows the MEX scheme with all instruments listed.

Figure 3.2- MEX scheme with all instruments indicated: 1: MARSIS. 2: HRSC. 3: OMEGA. 4: PFS. 5: SPICAM. 6: ASPERA-3. 7: Beagle 2 (failed on landing) radio experiment not shown.



Source: Chicarro et al. (2004).

Among the instruments, stands out for this thesis the ASPERA-3 and MARSIS. These instruments will be briefly described in the next subsection.

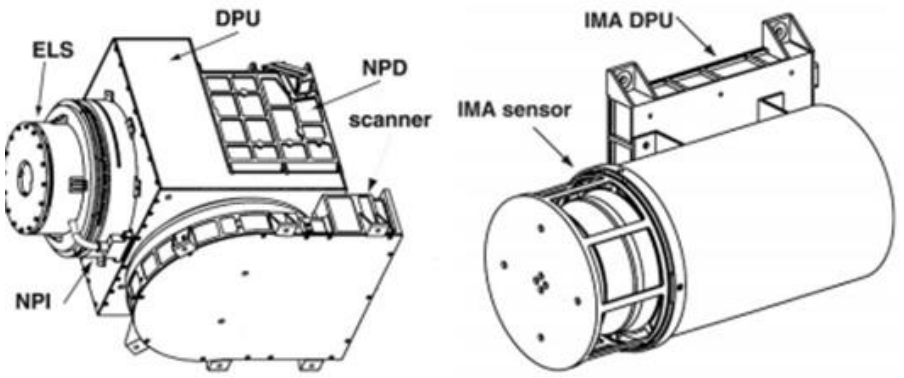
3.1.1.1 ASPERA-3

The goals of the ASPERA-3 instrument are to investigate the interaction of the solar wind with the Mars atmosphere, as well as to characterize the plasma environment and neutral gas of the planet using measurements of the ions, electrons and energetic neutral atoms. The main objective is to study the impact of the solar wind-Mars interaction on the atmosphere/ionosphere and the evolution of the Martian atmosphere (BARABASH et al., 2006).

ASPERA-3 is composed of four sensors, two Energetic Neutral Atoms (ENA) sensors (the Neutral Particle Imager (NPI) and the Neutral Particle Detector (NPD)), an electron spectrometer, which are located on the scanning platform, together with a Digital Processing Unit (DPU) in the main unit of the instrument, and the Ion Mass Analyser (IMA) in a separated unit, which is connected to the

main unit by a cable (BARABASH et al., 2004). Figure 3.3 shows an illustration of the ASPERA-3 configuration.

Figure 3.3- illustration of the ASPERA-3 configuration.



Source: Barabash et al. (2004).

In this thesis data from the ELS and the IMA were used, which are presented in more details below.

3.1.1.1.1 Electron Spectrometer (ELS)

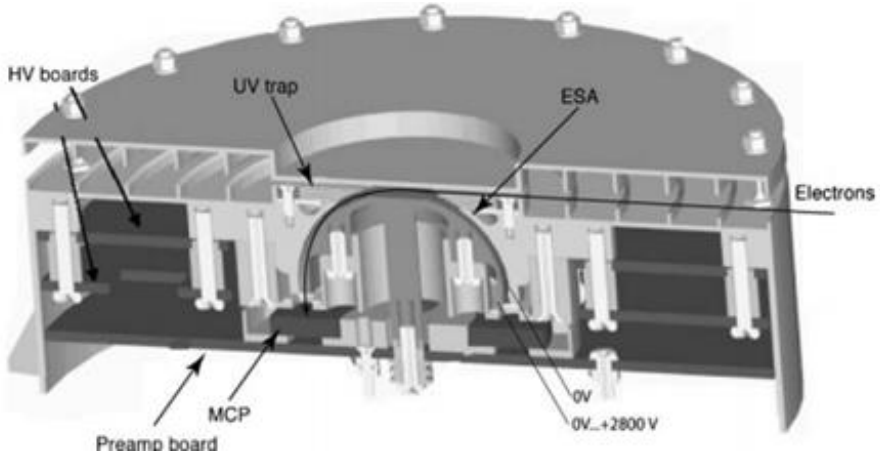
The ELS is a sensor that provides electron measurements in a 2D plane with a resolution of 4 seconds in an energy range between 0.01-20 keV. The sensor consists of a collimator system followed by a high standard top-hat electrostatic analyzer in a compact spherical design (BARABASH et al., 2004; BARABASH et al., 2006).

This top-hat analyzer covers 360ºx17º in the field of view (FOV). The typical top-hat analyzer consists of a collimator, a pair of concentric hemispheric deflective plates (inner hemisphere and outer hemisphere) and a particle counter (KEITH, 1999). In Figure 3.4 we have an illustration of the ELS sensor with a transversal cut. The black line represents the electron trajectory entering on the right. In this figure it is also possible to observe the ELS components: ESA, which corresponds to the Electrostatic Analyzer, UV trap, the HV Boards (high voltage), MCP (micro-channels plate) and the preamplifier board. Another

important point about the top-hat analyzer characteristics is that it allows a wide choice of geometric factors (SABLEK et al., 1988).

The collimator angle and the incidence length help to determine the elevation angle of the instrument field of view. Due to the detector cylindrical symmetry, particles of all azimuthal angles (360º) can be accepted simultaneously (KEITH, 1999). The top-hat of the ELS achieves a geometric factor of $5.88x10^{-4}cm^2sr.$, an opening angle of 17º and a gyro angle of 90º. The inner hemispheric radius is equal to 14.9 mm and the outer hemispheric is 15.9 mm (BARABASH et al., 2006). These parameters were chosen to achieve an energy resolution of about 7% to allow measurements of photo electron peaks within the thermal electron spectrum.

Figure 3.4- Illustration of the ELS sensor with a transversal cut.



Source: Barabash et al. (2006).

The ELS sensor has two energy sweep operational voltage ranges. The first range is from 0 to 21 V (about 150 eV) and the second range is from 0 to 2800 V (about 150 eV). Both operational voltage ranges have 4096 possible configurations. The sweeping of the instrument is totally programmable, with the restriction of a maximum sweep rate of 32 steps per second. This corresponds to a total time per step of energy of 31.25 ms. Since, in each step, the voltages of the deflector plate are kept constant during a minimum of 28.125 ms, this

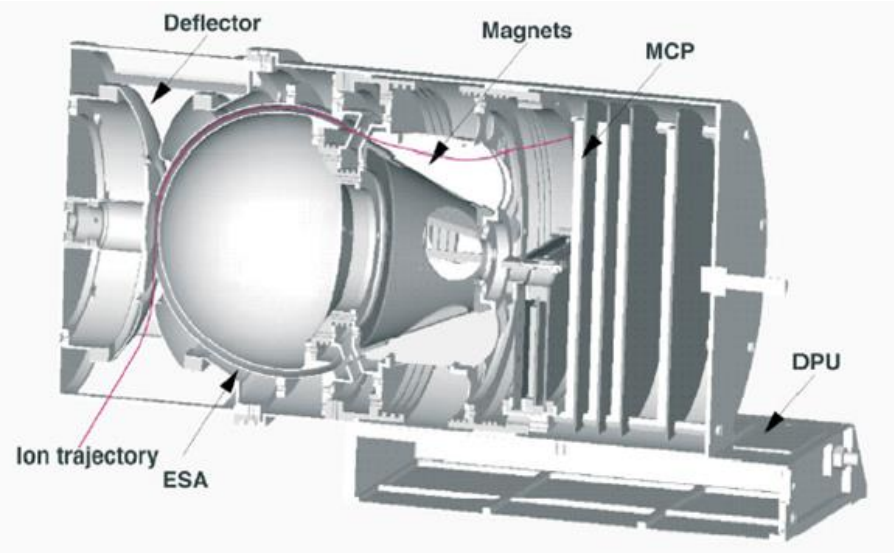
time can be used to accumulate electrons. The minimum latency time between each transition is 3.125 ms (BARABASH et al., 2006).

3.1.1.1.2 Ion Mass Analyzer (IMA)

The IMA is a detector that measures the main ion components (H^+, He^{2+}, He^+, O^+) in an energy range of 0.01- 36 keV, and a group of molecular ions with the mass/charge ratio between 20 and 80 ($20 < \frac{m}{q} < 80$) (BARABASH et al., 2006; DIÉVAL, 2011). As the ELS, the IMA also presents a deflection system and a top-hat electrostatic analyzer (BARABASH et al., 2004; BARABASH et al., 2006).

The IMA is a copy of the Ion Composition Analyzer (ICA) on board of the Rosetta spacecraft launched in 2003 to study the comet 67P/Churyumov-Gerasimenko (BARABASH et al., 2004). Figure 3.5 shows an illustration of the IMA of the ASPERA-3, where the principal components of the IMA are shown.

Figure 3.5- Illustration with a cross-away view of the IMA sensor. The pink line represents the ion trajectory, ESA represents the top-hat electrostatic analyzer, MCP the microchannel plates.



Source: Barabash et al. (2004).

The operation principle of IMA is always the same; the fastest loading parameter is the energy of the particle, which is scanning from 36 KeV to 10 eV in 96 steps logarithmically equidistant. After sweeping each energy range

completely, the instrument changes the polar angle of the FOV. Polar-angle scans range from -45 ° to 45 ° in 16 steps. The time for a complete energy scan is 12 s, with 16 different elevation angles to obtain the complete distribution. The total time required is 192 s (BARABASH et al., 2006).

3.1.1.2 MARSIS

The MARSIS is a low-frequency radar sounder designed to perform subsurface and ionospheric sounding. The primary objective of MARSIS is to map the distribution of water (liquid and solid) in the subsurface of Mars. The second objective is to characterize the surface and the third is the ionospheric sounding on the dayside, to characterize the interactions of the solar wind with the upper atmosphere and the ionosphere (PICARD et al., 2004; 2007).

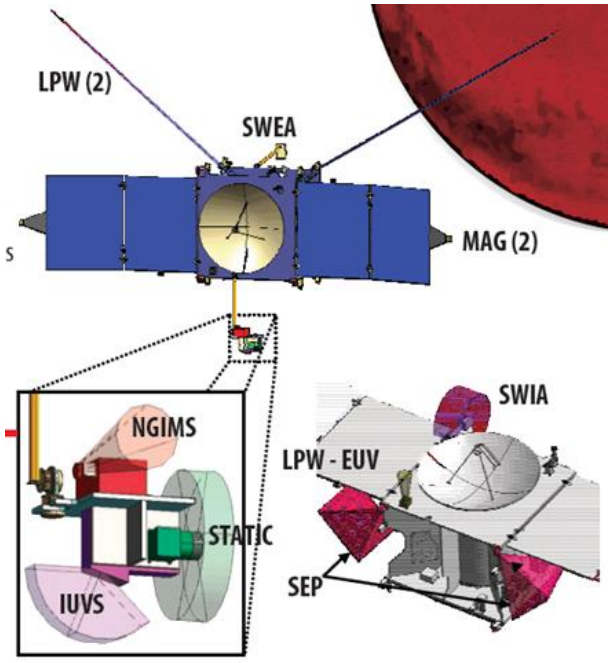
The MARSIS consists of a dipole antenna with a tip-to-tip length of 40 m, a radio transmitter, and a digital signal processing system (PICARD et al., 2004). That is able to make measurements from local electron plasma thermal and gyro tropic oscillations and remote soundings, which provides local ionospheric electron densities and magnetic field strengths (GURNETT, 2005; ANDREWS et al., 2013, DURU et al., 2014). The radar soundings measure the vertical range of the ionospheric reflection point as a function of frequency (PICARD et al., 2004). The local ionospheric electron density is obtained by direct measurement from excitation of local electron plasma oscillations during active ionospheric sounder mode. The magnetic field intensity can be derived by measures of the local electron cyclotron period, since the electrons follow a cyclotron orbit due to the magnetic field (ANDREWS et al., 2013).

3.1.2 MAVEN

The MAVEN spacecraft is an American mission that was launched by NASA in November 2013 and arrived at Mars in September 2014 (JAKOSKY et al., 2015). The mission is orbiting in an eccentric orbit with an inclination of 75º and period of 4.5 hours, with an apoapsis distance of 2.8 R_m and a normal periapsis of 150 km altitude. It also performs “DeepDipCampaigns” to altitudes near 125km, which is the homopause region.

The main scientific objective of the MAVEN mission is to determine the role that the loss of gas from the atmosphere to space has played through time in the Martian atmosphere and climate history. Other objectives are to characterize the upper atmosphere and ionospheric structure and to study the interactions of the Sun and the solar wind with Mars (JAKOSKY et al., 2015).

Figure 3.6- Illustration of the instruments distribution onboard MAVEN.



Source: Grebowsky (2012).

MAVEN is carrying nine instrument sensors, three to measure the properties of the ionosphere and plasma environment related to the escape and determine the composition and properties of the escaping ions, which are the Magnetometer, Langmuir Probe and Waves (LPW) and Suprathermal and Thermal Ion Composition (STATIC); two for measurements of the composition and structure of the neutral and ionized upper atmosphere, including the isotope ratios (Imaging Ultraviolet Spectrograph, IUVS and Neutral Gas and Ion Mass Spectrometer, NGIMS), and four for measurements of the properties of the solar wind and of the Sun that drive processes in the upper atmosphere: Solar Wind Ion Analyzer (SWIA), Solar Wind Electron Analyzer (SWEA), Extreme

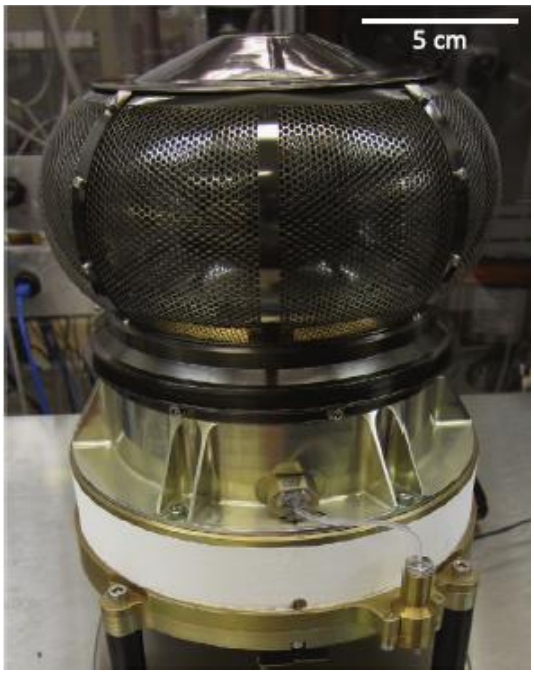
Ultraviolet Monitor and the Solar Energetic Particle detector (SEP). Figure 3.6 shows an illustration of the spacecraft with all its instruments.

In this thesis data from three MAVEN instruments have been used in the correlation length analysis: the magnetometer, SWIA and SWEA, which are described below.

3.1.2.1 SWEA

The SWEA is a Solar Wind Electron Analyzer, which measures the energy and angular distributions of the solar wind electrons, auroral electrons and ionospheric primary photoelectrons with an energy range of 3-4600 eV and a time resolution of 2 seconds (MITCHELL et al., 2016). The objectives of the SWEA are to determine the impact ionization rates and the plasma environment by distinguishing the energy spectra of the solar wind, magnetosheath, magnetotail and ionospheric primary photoelectrons. The instrument also has the aim to identify locations of magnetic cusps and extents of crustal mini-magnetospheres by capturing single and double-sided ionospheric loss cones, in order to determine the magnetic topology of Mars.

Figure 3.7- The Solar Wind Electron Analyzer.

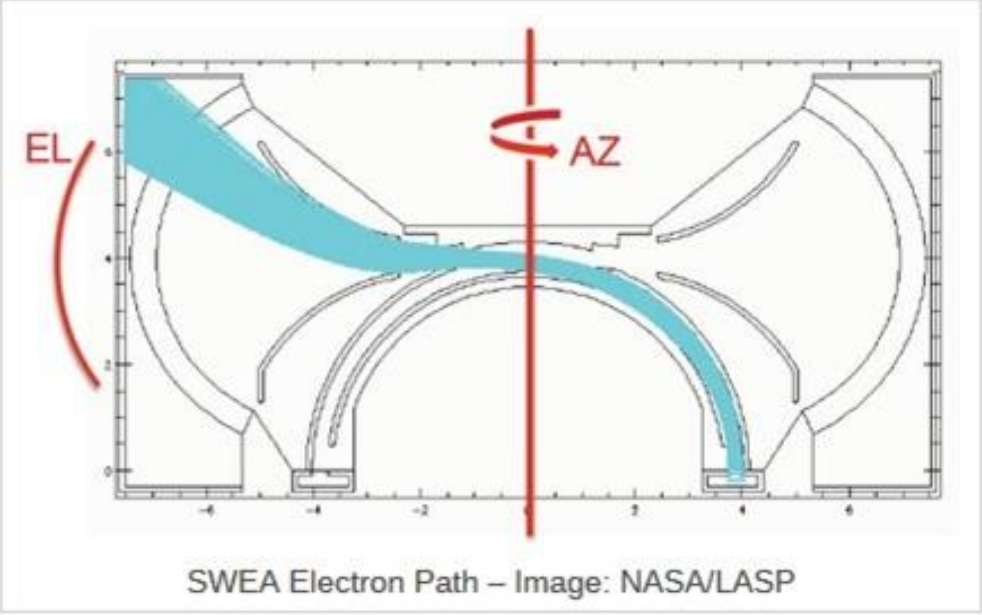


Source: Mitchell et al. (2016).

The sensor can also identify and determine the role of auroral (~keV) electron populations in ionization and dissociation processes (JAKOSKY et al., 2015). The SWEA has a field of view of 360 degrees by ± 65 degrees out of the normal plane. Figure 3.7 shows the SWEA sensor.

Similarly to the ELS from ASPERA-3/MEX, the SWEA is a hemispherical electrostatic analyzer, which has two plates (inner and outer) with a separation of 0.28 cm. Two gold plated deflectors are open to space through an aperture grid, which also provides thermal isolation. The path of the electrons is changed by the deflectors based on the electron energy before they reach the electrostatic analyzer. The electrostatic analyzer is responsible for selecting the energy of the deflected electrons (JAKOSKY et al., 2015). Figure 3.8 shows the path of electrons in the SWEA.

Figure 3.8- Illustration of the SWEA electron path.



Source: NASA/LASP (2018).

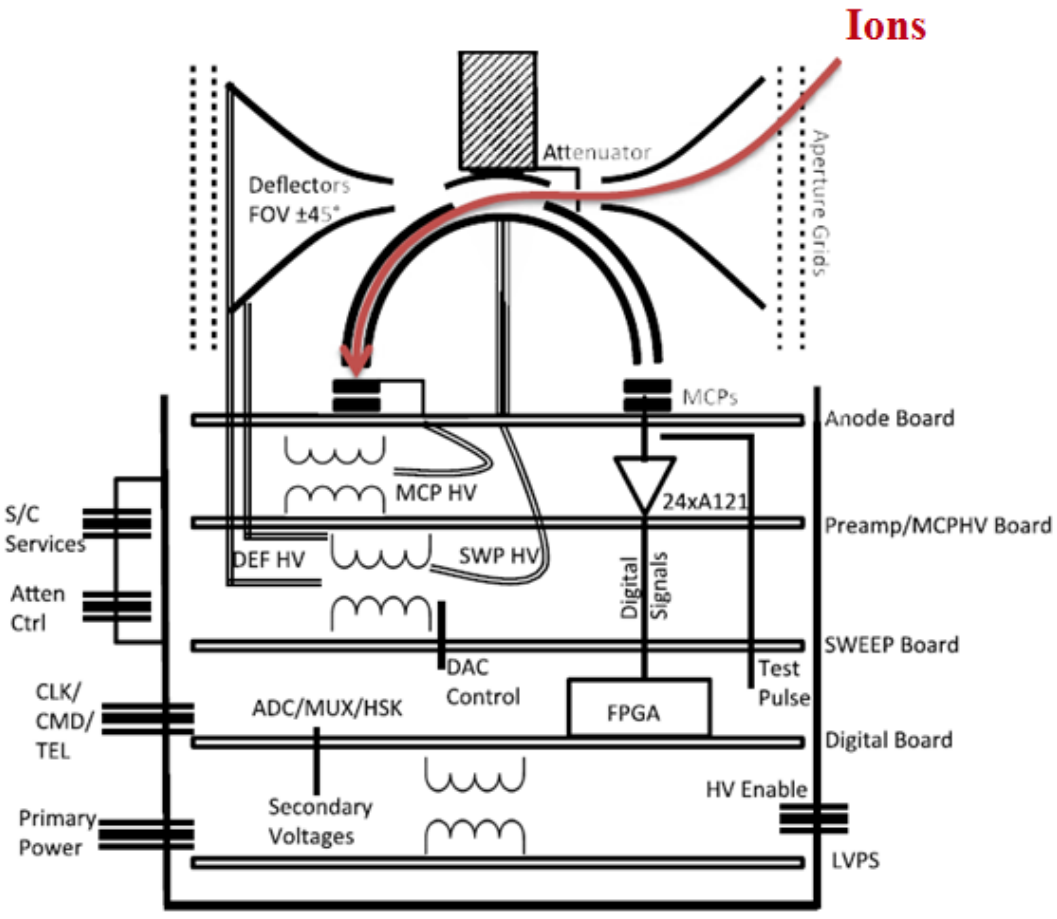
Microchannel plate detectors are reached by the electrons after passing through the instrument. The Microchannel plate has 16 anodes that form the 360 degree FOV due to their arrangement in a circular pattern. That arrangement of the

anodes provides an accuracy of 22.5 degrees in the azimuth of an incoming electron (SARAIVA, 2013).

3.1.2.2 SWIA

The Solar Wind Ion Analyzer is a cylindrically symmetric electrostatic analyzer with deflection optics, which measures ions with energies of 5 to 25,000 eV at an energy resolution of 13.5%. SWIA has the objective to determine the exchange rate and the plasma flow, from solar wind speed (between 30 to 2000 km/s) down to the stagnating magnetosheath speeds (HALEKAS et al., 2013). A scheme of the SWIA is presented in Figure 3.9, where the path of ions in the instrument can be observed.

Figure 3.9- Illustration of SWIA ion path.



Source: Halekas et al. (2013).

The SWIA measures velocity and density distributions from ions in the solar wind and magnetosheath. The instrument full FOV is 360 degrees by 90 degrees and has an angular resolution of 22.5 degrees and time resolution of 4 seconds (HALEKAS et al., 2016).

3.1.2.3 Magnetometer/ MAVEN

The magnetic field instrumentation onboard MAVEN consists of two independent and identical triaxial fluxgate magnetometer sensors, remotely mounted at the outer extremity of the two solar array panels on modest extensions called “boomlets”. The dual sensor configuration enables separation of effects of the magnetic field generated by the spacecraft from the ambient magnetic field (CONNERNEY et al., 2015a).

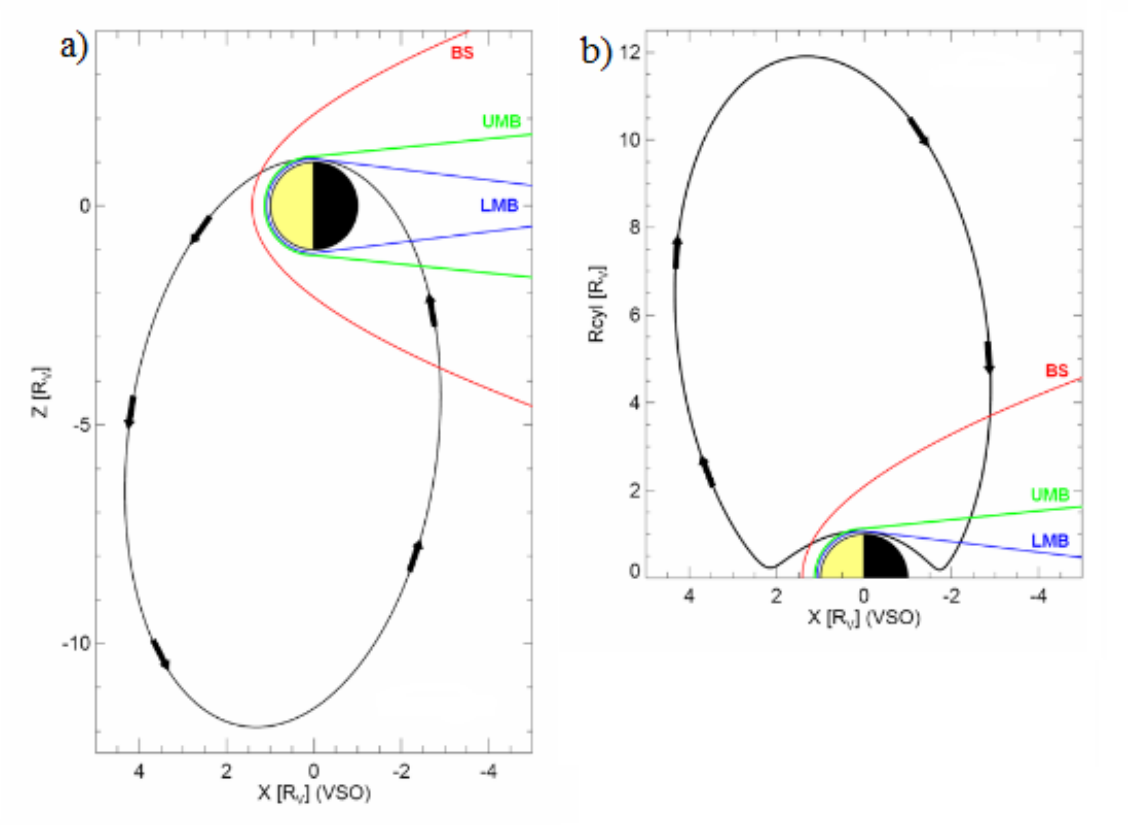
Both magnetometers sample the ambient magnetic field at an intrinsic sample rate of 32 vector samples per second (CONNERNEY et al., 2015a, 2015b). Each sensor measures the ambient vector magnetic field over a range of 65,536 nT per axis and has a resolution of 0.008 nT. The main goal of the instrument is to measure the direction and magnitude of the ambient magnetic field in the undisturbed solar wind (~3 nT), in the magnetosheath, where magnetic field varies in the range about 10-50 nT, and the crustal magnetic field is B <3000 nT (CONNERNEY et al., 2015a).

3.1.3 Venus Express

As the MEX was launched by ESA with the aim to study Mars, ESA also launched a mission to Venus, Venus Express (VEX), which used the basic design of MEX adapted for the conditions at Venus (SIVAC; SCHIRMANN, 2009). The VEX aim was to develop a global investigation of Venus atmosphere and plasma environment, the interaction of the solar wind with the atmosphere and aspects of the geology and surface physics of the planet (TIVOT et al., 2001; SVEDHEM et al., 2009). VEX was launched in November 2005 and arrived at Venus in April 2006. The mission was concluded in December 2014. The spacecraft orbited around Venus with an elliptical trajectory with a periapsis varying between 170 and 400 km altitude, and an orbital period of 24 hours (TIVOT et al., 2001).

Figure 3.10 shows a typical VEX orbit with the plasma boundaries of the planet marked. In the Figure 3.10-a) the x-axis represents the X_{VSO} (Venus Solar Orbit) and y-axis, Z_{VSO} direction. Figure 3.10-b) shows the orbit in cylindrical coordinates, where the x-axis corresponds to the X_{VSO} and y-axis to $R_{cyl} = \sqrt{{Y_{VSO}}^2 + {Z_{VSO}}^2}$.

Figure 3.10-a) Venus Express orbits in elliptical polar orbit in the XZ-pane. B) Venus Express orbit in cylindrical coordinates.



Source: Martinecz (2008).

Onboard the VEX spacecraft, 7 instruments were installed: 1- the Planetary Fourier Spectrometer (PFS), designed to measure global 3-D temperature field, 2- Spectroscopy for the Investigation of the Characteristics of the Atmosphere of Venus/ Ultraviolet and Infrared Atmospheric Spectrometer (SPICAV/SOIR), 3- Visible and Infrared Thermal Imaging Spectrometer (VIRTIS), 4- Venus Monitoring Camera (VMC), 5- Venus Radio-Science Experiment (VeRa), 6- Analyzer of Space Plasmas and Energetic Atoms (ASPERA-4) and 7- the

Magnetometer (MAG). Data from the last two instruments were used in this thesis and are described below.

3.1.3.1 ASPERA-4

The ASPERA-4 onboard on VEX is a replica of ASPERA-3 on MEX and also presents 4 sensors: the NPI, NPD, ELS and IMA. In this work data from ELS and IMA were used in order to perform the correlation length analysis and wave mode identification on Venus (BARABASH et al., 2006). As the configuration of the ELS and IMA from ASPERA-4 is similar to the instruments of the experiment ASPERA-3 described above, it will not be described here.

3.1.3.2 Magnetometer

The magnetometer of VEX as the magnetometer of MAVEN, measures the magnetic field vector using two triaxial fluxgate sensors. The outboard and the inboard sensors are separated by a distance of 1 meter, one sensor (outboard) is mounted on the tip of a boom made by carbon fiber, that has a length of 0.9 meter and the other sensor (inboard) is located directly on the spacecraft with a separation of 0.1 meter from VEX panel (ZHANG et al., 2006; 2008).

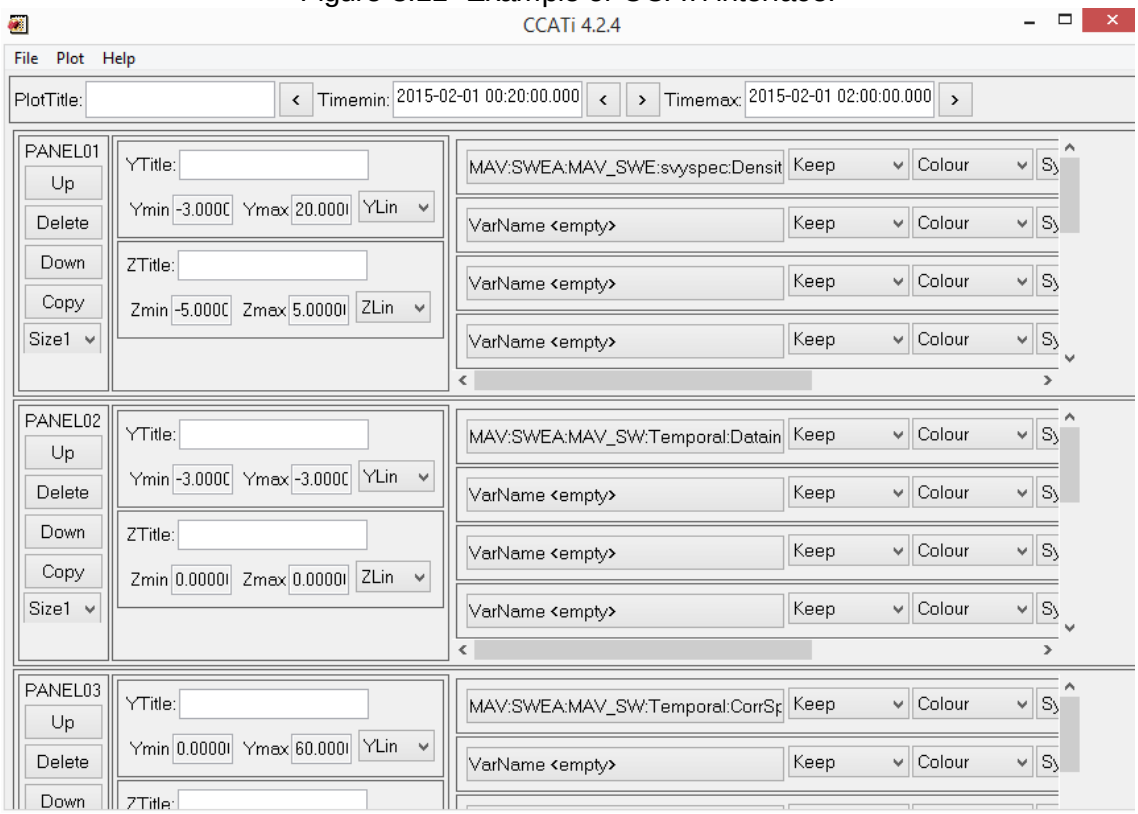
The goals of the MAG are to investigate the interaction of solar wind with Venus atmosphere, to study electromagnetic waves associated with atmospheric electrical discharge, to determine the strength and occurrence of them, to provide observations of waves associated with planetary ion pickup processes, and to measure the direction and magnitude of the magnetic field in the regions of the Venusian magnetosphere (magnetosheath, MPB, magnetotail) and ionosphere with high resolution in order to characterize the plasma boundaries between these regions (ZHANG et al., 2006).

3.2 CCATI Software

The CCATi was developed at the MPI for Solar System Research by Dr. Markus Fraenz et al., which consists in a software interface written in IDL, with an interactive composition of multi-panel, multi-trace time series plots. It contains routines adapted from Emmanuel Penous CLL3 software for reading CIS L2 and MEX/VEX ASPERA data (FRAENZ et al., 2016).

In this thesis the CCATi has been used for processing data, to build the plots of correlation length for a time series and also for making maps of correlation length around Venus and Mars. The software has also been used to plot some panels with time series and spectra of electron, magnetic field and ion data for the study of wave penetration in the ionosphere of Mars. Figure 3.11 shows the CCATi interface.

Figure 3.11- Example of CCATi interface.



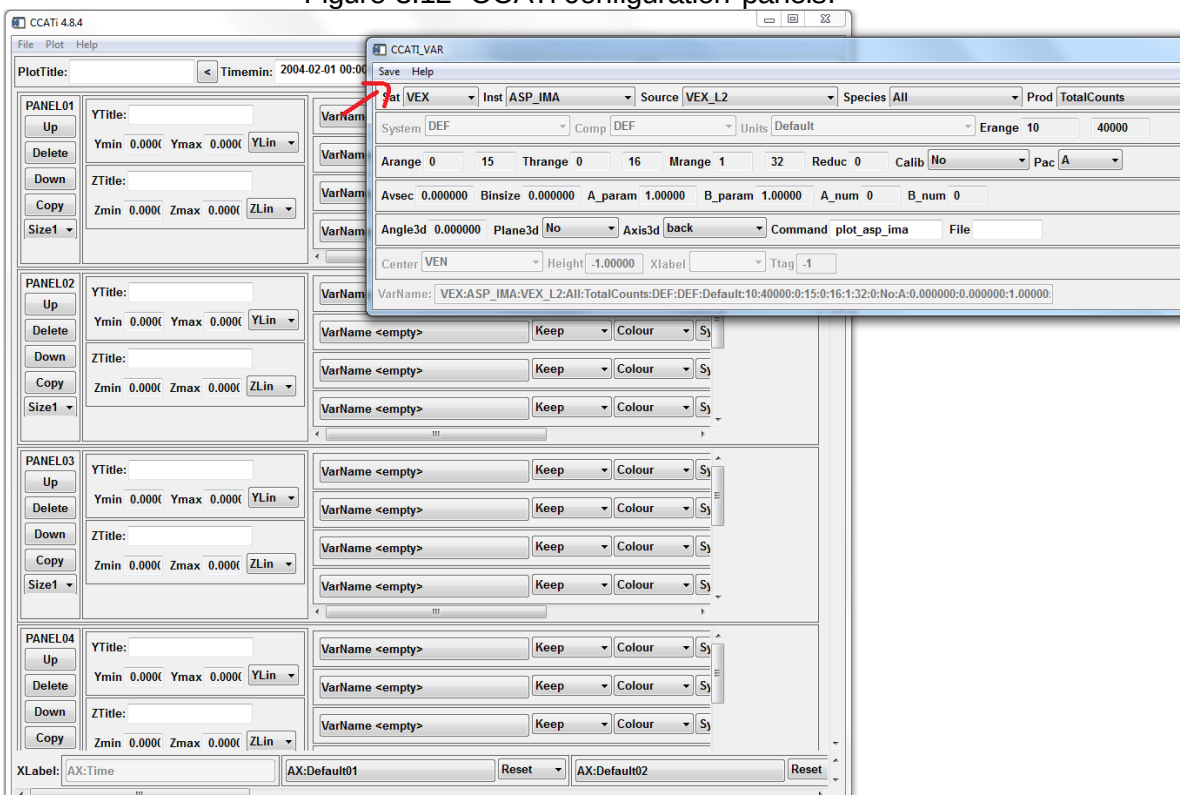
Source: Author production.

At the top of the Figure 3.11 the title and the interval of time can be defined. The panels for the plots can be configured, where the axis, color, variable symbols can be chosen. The software also supports statistical analysis via batch mode operation.

Each panel is configured in the specific window, where the spacecraft, instrument and parameters to be plotted and other configurations can be

chosen. Figure 3.12 shows an example of a window where the panel plot is configured in CCATi.

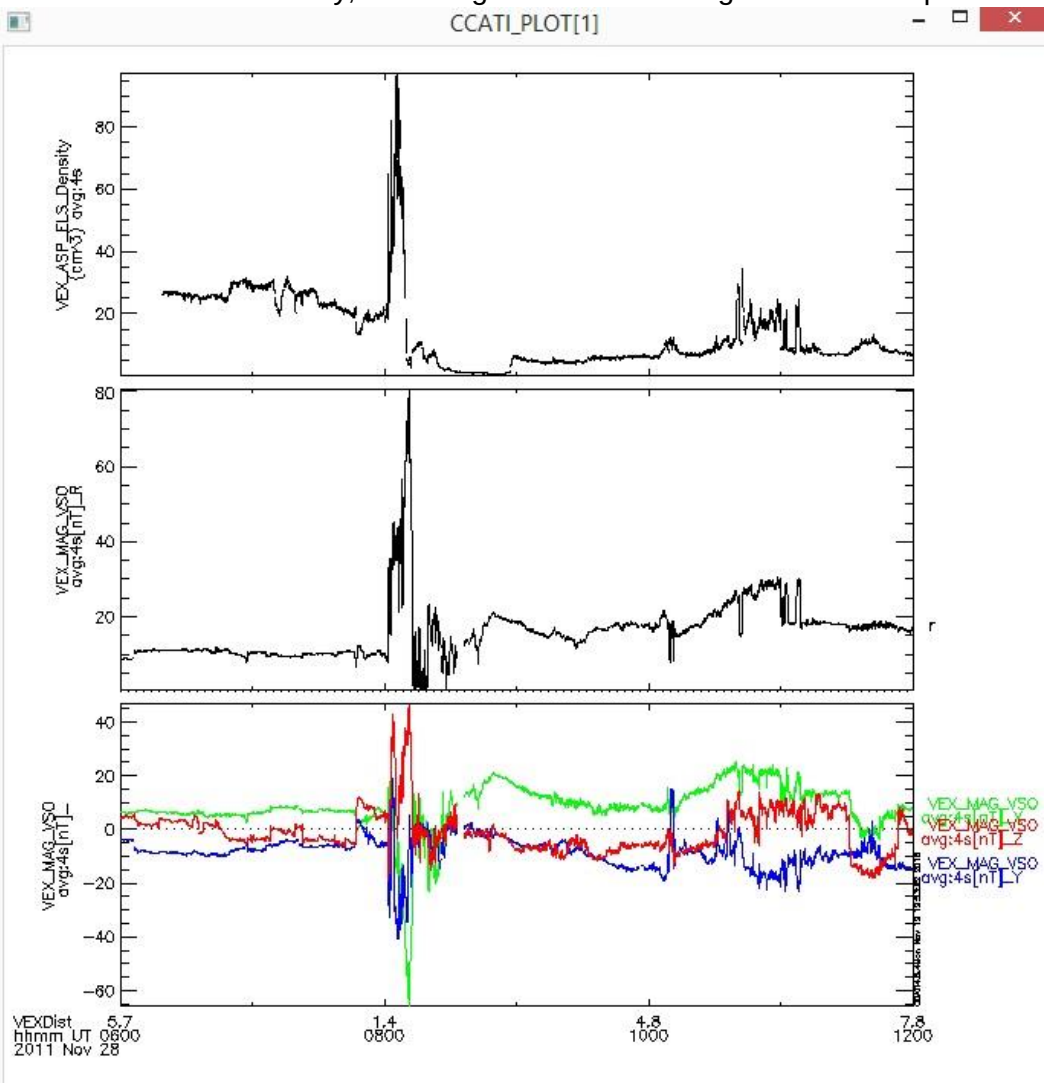
Figure 3.12- CCATi configuration panels.



Source: Author production

After defining the parameters, the plot of them can be done, where a new window will be generated. Figure 3.13 shows a plot for the interval between 06:00 UT, 28 November, 2011 and 12:00 UT, 28 November, 2011, with three panels. First panel presents the electron density, second, the total magnetic field, and the last, the magnetic field components (x in green, y in blue and z component in red), using VEX data.

Figure 3.13- CCATi plot from VEX, for the interval between 06:00 UT, 28 November, 2011 and 12:00 UT, 28 November, 2011. From the top to bottom: electron density, total magnetic field and magnetic field components.



Source: Franz et al. (2016).

3.3 METHODS OF ANALYSIS

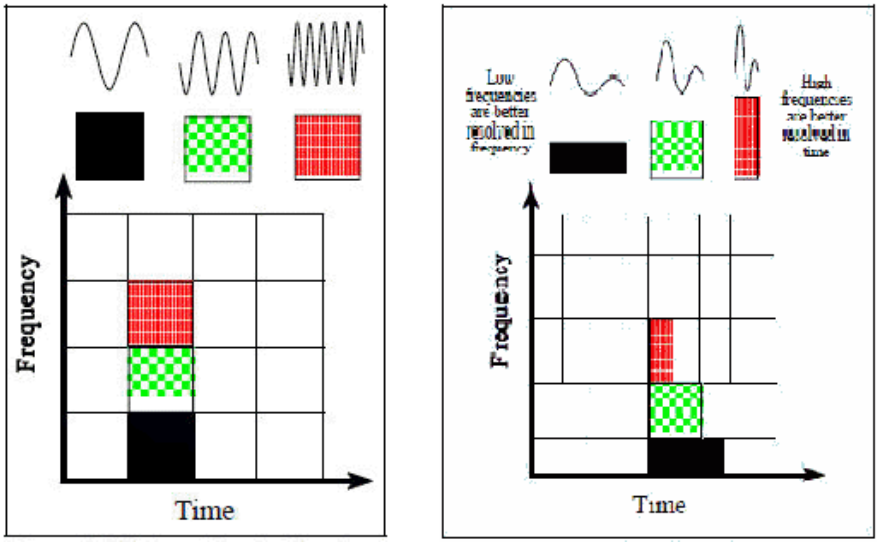
3.3.1 Wavelet Transform

The wavelet functions are used to analyze non-stationary signals (MORETTIN, 1992). Different from the Fourier transform, which approaches a function by a linear combination of sinusoidal components (each one with its frequency), the wavelet functions $\psi(t)$ are generated from a simple generating function, which undergoes expansions/contractions and translations in time. It consists of a set

of small waves, with a compact support, localized in time domains (space) and frequency (TORRENCE; COMPO, 1998; BOLZAN, 2004). Thus, it allows mapping changes in the properties of the non-stationary series.

Figure 3.14 presents an illustration of how the signal is studied in a time x frequency plane, for the Windowed Fourier Transform (WFT) and the wavelet transform (WT).

Figure 3.14- a) Windowed Fourier Transform. b) Wavelet Transform.



Source: Salem (2014).

In Figure 3.14-a) it is possible to notice that WFT signals are divided in various sections. The frequencies of the signal are studied using these small sections and the Fourier Transform computed in each section (window). The problem with the WFT is that the window is kept fixed and it is filled with oscillations with different frequencies. As smaller is the window, easier it is to notice sudden changes, such as peaks or discontinuities. But if we take lower frequencies, they do not fit in the small window. If a large window is chosen, the problem of the low frequencies are solved, but the temporal location (resolution) becomes poor (HUBBARD, 1995). In figure 3.14-b) we have the WT, where it is observed that the window presents variable size and scales. Then, if we use a small

window, high frequency components are observed, whereas large windows, we can see components with long duration and low frequencies.

Equation 3.1 presents the wavelet functions, which are known as daughter waves ($\psi_{a,b}(t)$), generated from the function called Wavelet-mother$\left(\psi(t)\right)$. The daughter is derived from the mother by dilatations/ contractions $\psi(t) \rightarrow \psi(2t)$ (represented by a parameter) and translations $\psi(t) \rightarrow \psi(t+1)$ (represented by b parameter) in time.

$$\psi_{a,b}(t) = \frac{1}{\sqrt{a}}\psi\left(\frac{t-b}{a}\right) \quad \text{for a, b } Z\text{,e } a \neq 0; \tag{3.1}$$

The wavelet transform can be classified as continuous or discrete (DAUBECHIES, 1992). Functions in which when applying the WT the signal is decomposed into frequencies are called discrete wavelets, where the wavelet functions are dilated and translated only in discrete values. In continuous functions, the WT transforms the signal f(t) into a function with two variables (scale and time), represented by WT (a, b) (HUBBARD, 1995). The continuous wavelet transforms are presented in equation 3.2:

$$WT(a,b) = \int f(t)\psi_{a,b}(t)^* dt, \tag{3.2}$$

$\psi_{a,b}(t)^*$ represents the complex conjugate of the mother-wavelet function.

In order to rebuild the signal, the Inverse Continuous Wavelet Transform (ICWT) is constructed, as given by equation 3.3.

$$ICWT(t) = \frac{1}{c_\psi}\int_{-\infty}^{\infty}\int_{0}^{\infty}\frac{1}{a^2}TW(a,b)\psi^*{}_{a,b}(t)dadb, \tag{3.3}$$

It is calculated from the daughter-wavelet functions, combined with the wavelet coefficients (c_ψ), which ensure the functions invertibility (YOUNG, 1993).

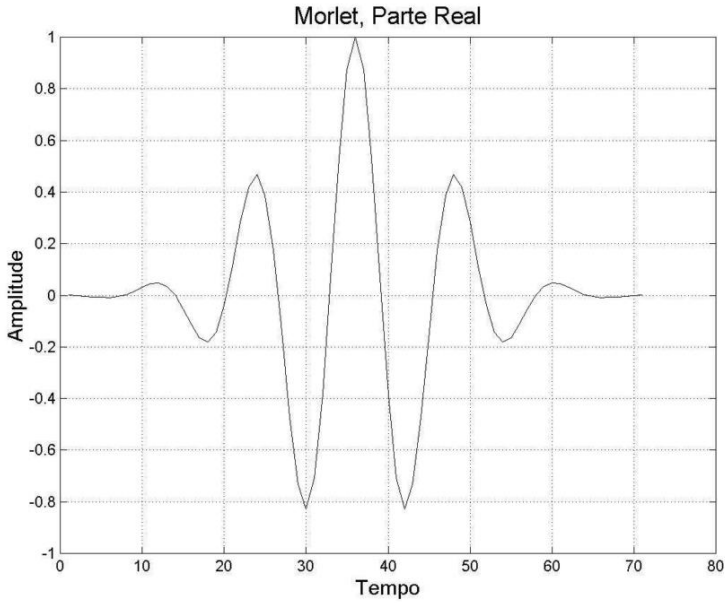
There are many wavelet functions (Haar, Mexican-hat, Morlet, etc). Each one of them, present characteristics that make them suitable for a type of phenomenon. In this work the Morlet wavelet is used.

The Morlet Function is continuous and can be represented by equation 3.4 (BOLZAM, 2006):

$$\psi(t) = e^{i\xi_0 t} e^{\frac{-t^2}{2}}, \tag{3.4}$$

where ξ_0 is a dimensionless frequency which controls the number of oscillations in the wave packet. In this work, we used $\xi_0 = 6$. Figure 3.15 shows the real part form of the Morlet Wavelet.

Figure 3.15- Real Part of Morlet Wavelet for $\xi_0 = 5$.



Source: Bolzam (2006).

3.3.1.1 Global Wavelet Spectrum

The Global Wavelet Spectrum (GWS) will be used in order to identify the major periods (most energetic) in each magnetosheath crossing. The GWS is given by equation 3.5:

$$GWS = \int |WT(a,b)|^2 db. \tag{3.5}$$

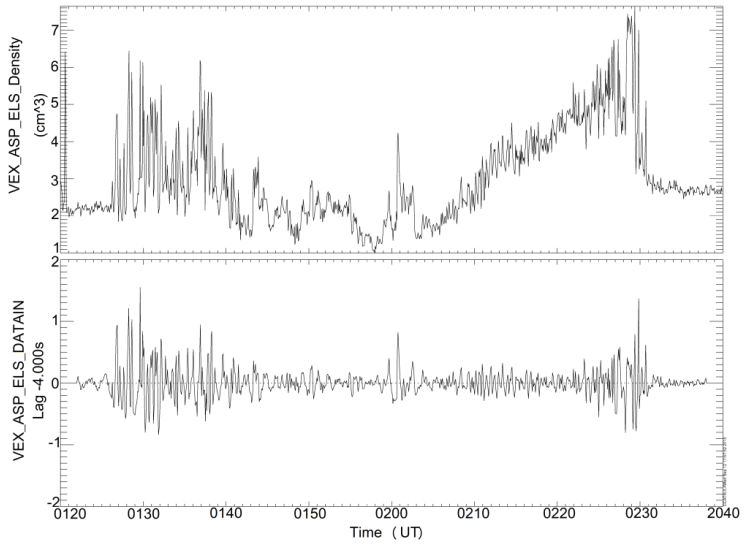
The Morlet wavelet has good location in frequency, which is necessary in this work, since one of the objectives of this work is to study plasma oscillations in the magnetosheath of Mars. The aim is to identify the characteristic frequencies of electron density and electron temperature in this region.

3.3.2 Correlation Length Analysis

One of the definitions of the correlation length is a characteristic scale over which fluctuations in a variable are correlated (FISK; SARI, 1973). In other words, the correlation length is the distance from a point beyond which there is no further correlation of a physical property associated with that point (MELA; LOUIE, 2001; WICKS et al., 2010).

Since our plasma wave regime of study is in the ULF range, before computing the correlation length, the Fourier transform filter was applied to remove very high and very low frequencies present in the data. In the frequency domain, a range between 8 and 50 mHz band pass filter was defined, then the inverse Fourier transform was used to return to the time domain. The frequency range was defined due to that range corresponding to the general wave frequencies generated at the bow shock and also due to the resolution of the instrument, which is of 4 seconds. Figure 3.16 shows an example of the data where the Fourier transform was applied to remove the high and low frequencies in the electron density data (ASPERA-4/VEX) from 01:20 UT June 26, 2006 to 02:40, June 26, 2006. In the top panel we have the original data, and in the bottom panel the time series after removing the high and low frequency part.

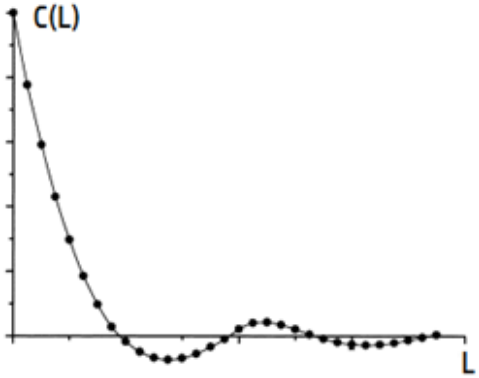
Figure 3.16-Removal of high frequencies of the data. First panel is the original data and second panel, is the data after employing the Fourier Transform.



Source: Author production.

In order to compute the correlation length the autocorrelation function (AC) was calculated. The AC function was calculated lagged by a time between 0 and 60 s and sliding a window with 120 s across the data. Figure 3.17 shows the representation of the AC curve.

Figure- 3.17- The autocorrelation curve. The x axis represents the lag (L) and the y axis represents the correlation as function of the lag.



Source: Adapted from Kofke (2018).

The AC curve can be represented by an exponential of the lag (L) by the largest lag (CL), as it is shown in Equation 3.6.

$$AC(L) = e^{|-L/CL|}, \tag{3.6}$$

where CL is the correlation length.

To obtain the correlation length, an exponential fit must be employed in the auto-correlation curve.

$$lnAC\,(L) = \frac{L}{CL}$$

Then,
$$CL = \frac{L}{lnAC\,(L)} \tag{3.7}$$

After that, a linear regression ($Y = A_0 + A_1X + \cdots$) has been employed in equation 3.7. Here, y represents the maximum correlation, 1. The curve does not intercept the y axis, then $A_0 = 0$. Here, X is related to the correlation lengths and A_1 the AC function after the exponential fit.

The correlation length can then be found as (Equation 3.8):

$$CL = \frac{1}{A_1} \tag{3.8}$$

The correlation length has many applications in different areas, such as, in the study of structures in the solar wind (FISK; SARI, 1973; WICKS et al., 2010), molecular dynamics simulation (MORAES; NUEVO, 1993), scattering of cosmic rays (PARHI et al., 2002), turbulent boundary layer flight data (PALUMBO, 2012), among others.

Here the CL are given in a temporal scale, to obtain the correlation length in a spatial dimension (CL_S); the temporal correlation length (CL_T) must be multiplied by the solar wind velocity (V_{SW}), as Equation 3.9 shows.

$$CL_S = CL_T . V_{SW} \tag{3.9}$$

In the analyses done in this thesis the ASPERA-3/IMA velocity was used for MEX, SWIA velocity for MAVEN and ASPERA-4/IMA velocity for VEX.

3.3.3 Wave Modes Identification

The wave modes can be identified by determining correlation function ratios between the particle and field bulk parameters (GARY; WINSKE, 1992; and our results in FRAENZ et al., 2017). Using field and particle data it is possible to determine transverse (T_R), compression (C_R), partition (P_R) and Doppler (D_R) ratios. The transverse ratio (Equation 3.10) compares the power in waves transverse to the mean magnetic field with the wave power parallel (or compressional) to the mean field. The compressional ratio compares the wave power in the plasma thermal pressure to the magnetic field wave power (Equation 3.11). The partition ratio compares the wave perturbation in the plasma thermal pressure to the magnetic pressure perturbation (Equation 3.12) and the Doppler ratio (Equation 3.13) compares the perturbation power in the plasma velocity to the magnetic field wave power (SONG et al., 1994).

$$T_R = \frac{\delta B . \delta B - {\delta B_\parallel}^2}{{\delta B_\parallel}^2} \tag{3.10}$$

$$C_R = \frac{\frac{\delta P^2}{{P_0}^2}}{\frac{\delta B.\delta B}{{B_0}^2}} \quad (3.11)$$

$$P_R = \frac{\frac{\delta P}{P_0}}{\frac{{\delta B_\parallel}^2}{B_0}} \quad (3.12)$$

$$D_R = \frac{\frac{\delta V.\delta V}{{V_0}^2}}{\frac{\delta B.\delta B}{{B_0}^2}} \quad (3.13)$$

In Equations 3.10-3.13, B_0 denotes the mean magnetic field, P_0 the mean particle pressure and V_0 the mean velocity in a given time window. $B_\parallel$ denotes the field component parallel to the mean field. The δQ represents the power of the variation of a given quantity Q. Since this power is frequency dependent this quantity can be expressed by the Fourier spectral density, such that all ratios become frequency dependent.

Generally, ion physics are used to define ULF dynamics, not electron physics. The VEX data set has only electron data at high time resolution and several assumptions have to be done:

1. Ion temperature does vary slower than ion density, than $\frac{\delta P}{P_0}$ can be replaced by $\frac{\delta n}{n_0}$ and $\frac{\delta P^2}{{P_0}^2}$ by $\frac{\delta n^2}{{n_0}^2}$ (same assumption made by RUHUNUSIRI et al., 2015a).

2. The plasma is quasi-neutral, then only electron density can be used: $n = n_e$.

3. While the 2D electron distribution does not allow an absolute velocity determination the variation of the 2D electron velocity is still representative of the ion velocity variation in a quasi-neutral plasma: $D_R = \frac{\delta V_e.\delta V_e}{{V_{0e}}^2}$.

For the numerical application of this scheme, fast Fourier transforms of all quantities (denoted as δ in the scheme) have been taken in a sliding window

normalized to the mean in this window, as the method described by Ruhunusiri et al. (2015a). Then we derive ratios of these transforms for the midpoint of each time window. To do this the data has been resampled on a common time axis with 4s resolution and a linear interpolation across small data gaps was made.

In a sliding window of 128s it is possible to determine:

(1) The mean of each quantity (B_0,P_0 and V_0);

(2) The parallel component of the magnetic field $B_{\parallel} = BB_0$;

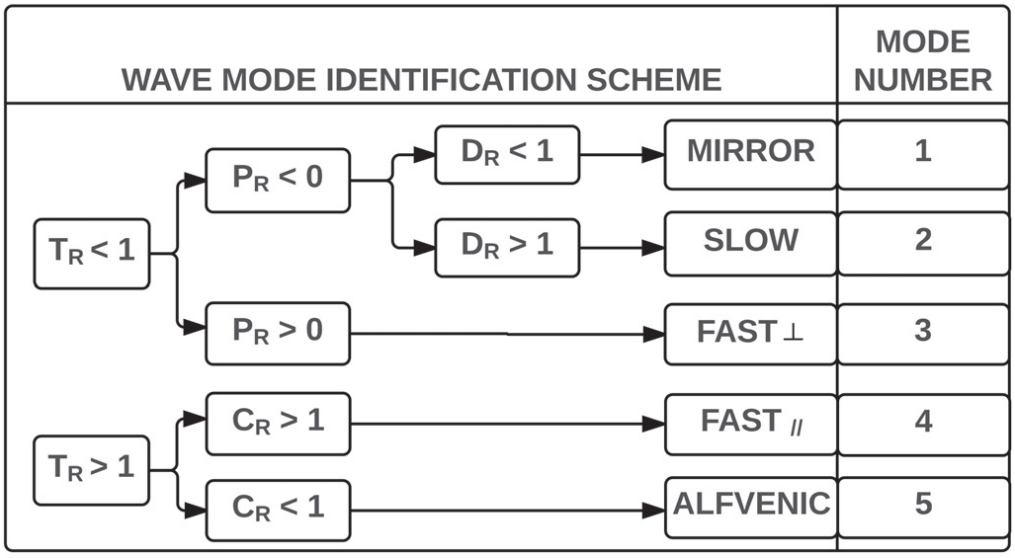
(3) The fast Fourier transform of each quantity (B_0,P_0 and V_0);

(4) The ratios defined above for each frequency step, and

(5) The dominant wave mode for each frequency step as a number from 1 to 5.

Figure 3.18 shows the scheme of the wave mode identification based in the Song et al. (1994) scheme.

Figure 3.18 Wave mode identification scheme after Song et al. (1994).



Source: Fraenz et al. (2017).

Each wave mode is represented by a number from 1 to 5. Mirror modes is represented by 1, Slow mode by number 2, Perpendicular fast mode by 3, parallel fast mode by 4 and Alfvenic mode by number 5. The determination of

each one is made following the wave mode characteristics, for example, if it is more transversal, compressional, if the perturbation is higher in the plasma then magnetic field, etc. As it was described in section 2.2.2, Alfven waves is transversal and dominated by the non-compressional component, by the scheme of Figure 3.18, the Alfvenic wave mode is identified when Transversal ratio is larger than 1, and when the compressional ratio is lower than 1, as this kind of waves is characterized. The same reasoning was used in the identification of the other wave modes.

4 RESULTS

This chapter is dedicated to the presentation and discussion of the results obtained in the development of this thesis. For better presentation of results, it is divided in two subsections: one dedicated for the results obtained for Mars and one for Venus results.

4.1 Mars

In order to conduct the study about ULF waves in the Mars magnetosphere, three different analyses have been done in this thesis. The first consists in the identification of the main frequencies in the Mars magnetosheath. The second analysis is the determination of the correlation lengths around the planet, and the last analysis is the study of cases of potential wave penetration into the ionopause. Besides, the catalog of plasma boundaries has been extended until 2016.

4.1.1 Identification of the Plasma Boundaries on Mars

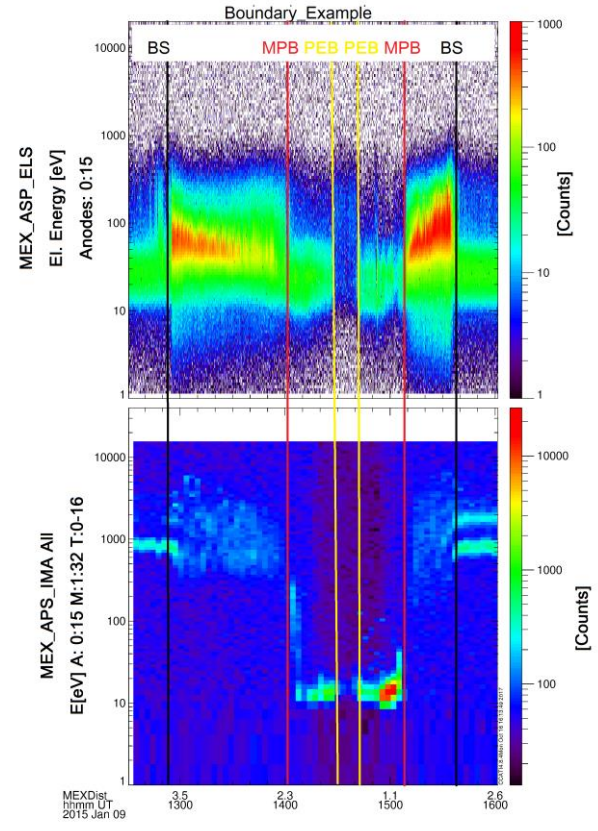
In order to develop the study of the ULF waves in the magnetosheath of Mars, it is necessary to know the location of the plasma boundaries of the magnetosphere of the planet. The boundaries for the years between 2005 and 2013 have been identified by Xiuhong Han (2014). In order to apply the study for the whole interval of the MEX (2004-2016) mission the boundaries of the years 2004, 2014, 2015 and 2016 had to be identified in this thesis.

For the identification of the boundaries, a list of data intervals where the MEX is at a maximum of 4 R_M of distance of the planet for the interval of 7 hours (approximately the duration of the MEX orbit) has been compiled using the CCATI software. After that, plots with the electron and ion spectra for each interval have been made. The identification of the boundaries in the plots is done manually following the same criteria defined by (MARTINECZ et al., 2008).

The bow shock can be identified by a sudden increase in the temperature of the electrons and ions due the heating of the plasma at the boundary. The MPB inbound crossings are characterized by a decrease in the magnetosheath (energetic) electron density and increase of planetary ions flux. In the ion spectrum, ions with low energy are observed in the magnetic pile-up region, which helps to identify the boundaries of the region (MPB and PEB). The PEB is also identified where the flux of the electrons and ions are very low.

The boundaries are selected visually by clicks on the screen in the region where the criteria are met, where each boundary is represented by a number from 1 to 6, where 1 to 3 represent the inbound BS, MPB and PEB, respectively, and 4 (PEB), 5 (MPB) and 6 (BS) represent those outbound boundaries. Selecting these boundaries, a file with the index of the boundary and the time where the MEX has crossed is generated. Figure 4.1 shows an example of the identification of the plasma boundaries of Mars following these criteria.

Figure 4.1- Example of the identification of plasma boundaries on Mars.



Source: Author production.

In the study of the ULF waves in the magnetosheath we are interested in the intervals between boundaries 1-2 and 5-6 that correspond to the magnetosheath. For 2004 we do not have a significant number of intervals with data for this analysis, so the data from this year was disregarded in this study. Between 2014 and 2016 a total of 1766 new magnetosheath crossings (APENDICE A) have been identified in this thesis.

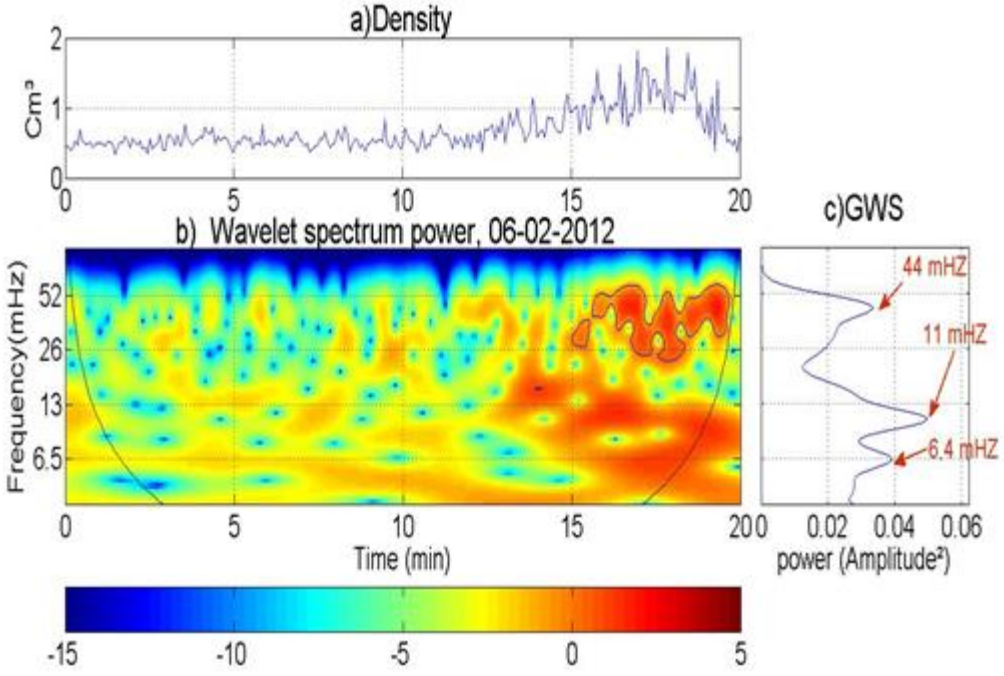
4.1.2 Wavelet Analysis

In order to obtain the main periods of low frequency plasma oscillations in the Mars magnetosheath, the WT was applied to 9667 magnetosheath crossings observed from 2005 to 2016 for electron density and electron temperature data. The data of this analysis have a time resolution of 4 seconds and the Morlet wavelet a wave number of six, since its shape gives good time localization.

4.1.2.1 Periodicities in Electron Density Data

Figure 4.2 shows an example of the WT results applied to the electron density for the interval wherein the MEX crossed the Mars magnetosheath, between 02:45 UT and 03:06 UT on February 06, 2012.

Figure 4.2- Panel a) $N_e$data. Panel b) Wavelet spectrum. c) Global Wavelet Spectrum.



Source: Author production.

Figure 4.2-a) shows the electron density time series. The wavelet spectrum power is shown in Figure 4.2-b), and in Figure 4.2-c) the global wavelet spectrum, where we note the presence of three main frequencies: 44 mHz, 11 mHz and 6.4 mHz.

The goal here is to find the range of periods where frequencies with high power are observed. After applying the WT to the electron density during the 9667 magnetosheath crossings, 22912 frequencies were identified in the wavelet spectra, which results in an average of 2.37 frequencies per interval. These were divided into ranges (from 5 to 70 mHz) to perform a statistical analysis. Frequencies lower than 5 mHz were disregarded, since they can be caused by the spacecraft potential itself (ESPLEY et al., 2004; LUHNDIN et al., 2011).

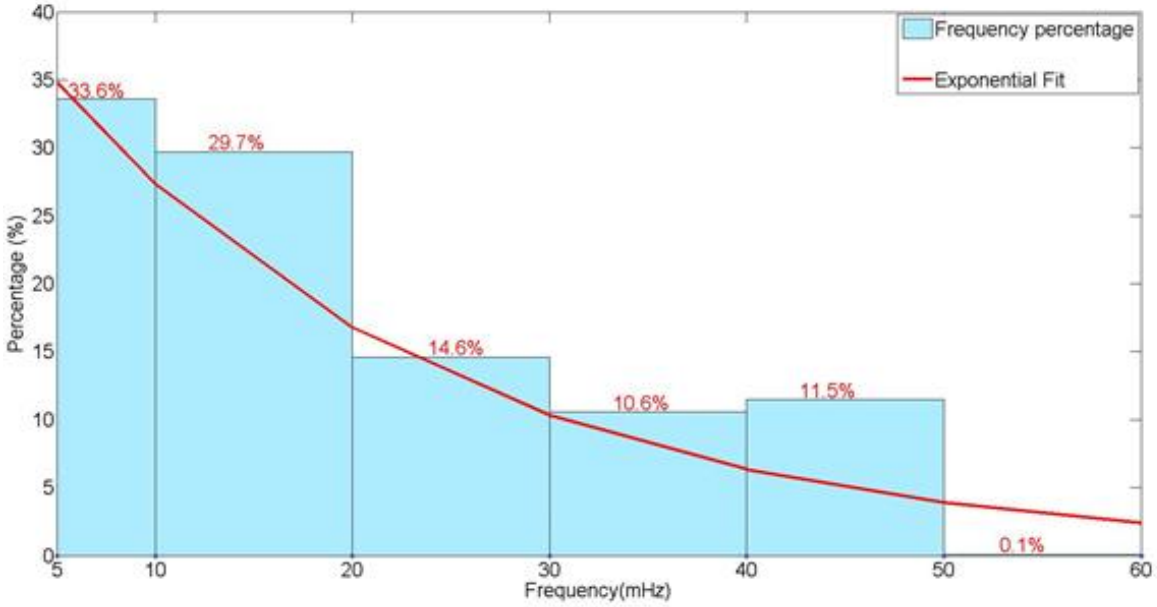
Table 4.1 presents the ranges of frequencies used in this analysis, the number of frequencies in each range, and the percentage of each frequency range in relation to the total interval.

Table 4.1- Frequencies presented in each range of frequencies.

Frequencies (mHz)	number	Percentage (%)
$5 < f \leq 10$	7704	33.6
$10 < f \leq 20$	6797	29.7
$20 < f \leq 30$	3342	14.6
$30 < f \leq 40$	2425	10.6
$40 < f \leq 50$	2630	11.5
$50 < f \leq 60$	14	0.1
Total	22912	

Figure 4.3 shows the histogram that was made from the results shown in table 4.1 with an exponential fit ($Ae^{-\lambda t}$) of the frequencies (red curve). Here A is equal 43.79 and $\lambda = 0.47$.

Figure 4.3- Histogram of the percentage of the principal frequencies in electron density in the magnetosheath of Mars.



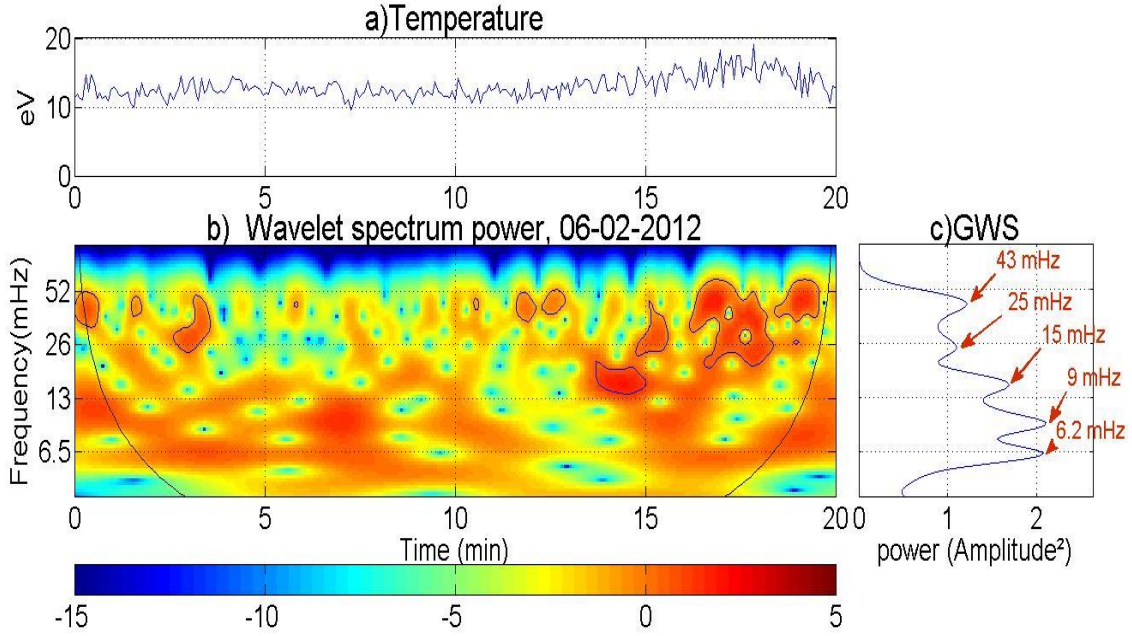
Source: Author production.

In Figure 4.3 we can notice that the main frequencies observed in the electron density were in the range 5-10 mHz with 33.6%. Further, the second peak was observed in the range 10-20 mHz with 29.7% of the 22912 frequencies identified. Considering those two ranges, we have that 63.2% of the frequencies occur in the interval of 5-20 mHz.

4.1.2.1.1 Periodicities in Electron Temperature data

The same study was performed for the electron temperature. Figure 4.4 shows the WT results applied to the electron temperature for the same interval wherein the MEX crossed the Mars magnetosheath presented in Figure 4.2. In Figure 4.4-c) we note the presence of five main frequencies: 43 mHz, 25 mHz, 15 mHz, 9 mHz and 6.3 mHz.

Figure 4.4- Panel a) T_e data. Panel b) Wavelet spectrum. c) Global Wavelet Spectrum.



Source: Author production.

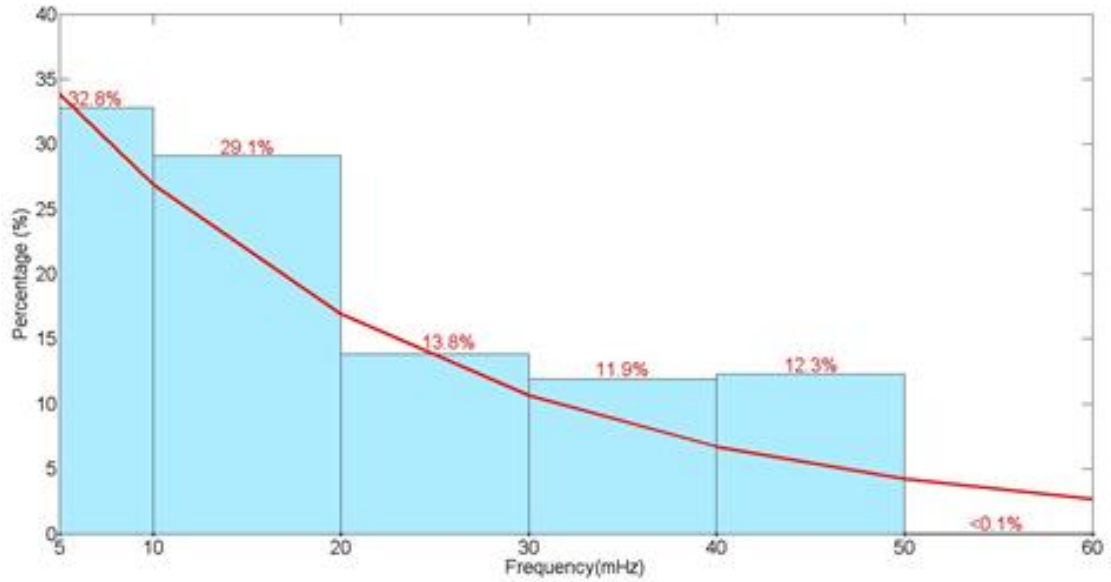
Applying the WT, 23395 frequencies were identified in the electron temperature time series, an average of 2.42 frequencies per interval.

Table 4.2- Frequencies presented in each range of frequencies.

Frequencies (mHz)	Number	Percentage (%)
$5 < f \leq 10$	7676	32.8
$10 < f \leq 20$	6812	29.1
$20 < f \leq 30$	3238	13.8
$30 < f \leq 40$	2789	11.9
$40 < f \leq 50$	2877	12.3
$50 < f \leq 60$	3	< 0.1
Total	23395	

Table 4.2 and Figure 4.5 present the ranges of main frequencies that were found. We observe that the most energetic frequencies are also located between 5-10 mHz with 32.8% of the cases. Considering two ranges (5-10 mHz and 10-20 mHz) as it was done for the frequencies of the electron density study, 61.9% of the principal frequencies are observed between 5-20 mHz, which is the same range observed in electron density. The red curve represents the exponential fit of the frequencies. The parameters of the exponential fit in the histogram of the temperature are: A=42.68 and $\lambda = 0.05$.

Figure 4.5- Histogram of the percentage of the principal frequencies in electron temperature in the magnetosheath of Mars.



Source: Author production.

These results agree with the findings by Winningham et al. (2006), where they used the integrated electron energy flux to study the electron oscillations in the induced magnetosphere of Mars. Those authors also observed an energetic peak between 10 and 20 mHz in the magnetosheath. They have interpreted it as corresponding to the oxygen ion gyrofrequency in the Mars magnetosheath, calculated using data from the magnetometer from MGS (ESPLEY et al., 2004). It is believed that for large scales (greater than the Debye Length λ_D), the plasma should be electrically neutral, and electron density approximately equal

to ion density (Ne ≅ Ni). When ion wave modes of large scale develop, they carry with them the electrons which are associated with the oscillating ions. Then, the electrons take their wavelike behavior. Electrons oscillate at higher frequency, but they also respond to lower frequencies to maintain quasi-equilibrium with positive ions. Therefore, when we observe in the ULF domain, the electrons trace the movement of the ions and the wave modes thereof (WINNINGHAM et al., 2006).

Lundin et al. (2011) also found out similar results where the most energetic frequencies are found between 3 and 20 mHz fot ULF waves at the magnetosheath. They also observed that the average magnitude of magnetosheath waves is up to ten times higher than the wave magnitude of the O^+ and expected that ULF wave power is correlated with the O^+ outflow. This result shows an evidence of the relation between the ULF wave power and atmospheric loss on Mars. Frequencies between 2-3 mHz have been observed as fundamental to oscillations in density and velocity time series (GUNELL et al., 2008), and they are observed in regions where there is velocity shear in the plasma flow. Fowler et al. (2017) have studied wave power in the electric and magnetic field in various frequency bands. Their results show that high wave power was observed in the range of ULF, mainly in the region of the magnetosheath. They also have observed that energetic wave and the Poynting flux (2-16 Hz) reaches the upper ionosphere. Thus, it can be assumed that the power of waves generated at the magnetosheath can propagate until regions below the Martian magnetosphere.

The major source of the oscillations is probably due to the bow shock where the ions are reflected at the boundary (TARASOV et al, 1998; ESPLEY et al., 2004; GUNELL et al., 2007; LUNDIN et al., 2011). At the bow shock ions backstreaming along connected lines of the magnetic field are also associated to those waves, as well as the picked-up ions photoionized from the neutral gas corona (RUSSELL et al., 1990; LE; RUSSELL, 1992).

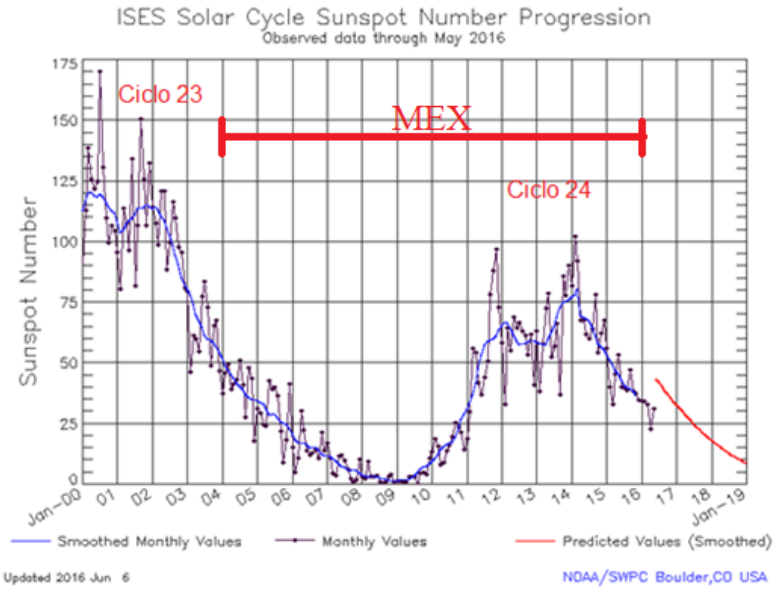
4.1.2.2 Search for Periodicities Variation with Solar Cycle

In the study of Mars plasma environment, the phases of solar cycle have been found to influence the ion escape ratio (MODOLO et al., 2005; LUNDIN et al,

2013, DONG et al., 2015), density and temperatures of the ionosphere (SÁNCHEZ-CANO et al., 2016) and consequently on the formation of the magnetospheric obstacle, since the ionospheric plasma pressure is higher during the solar maximum (high activity) phases of the solar cycle and consequently the Martian plasma system is strong enough to withstand against the solar wind flux (SÁNCHEZ-CANO et al., 2017).

In this study we have used data for an interval of a full solar cycle (11 year of MEX data).Thus, we search if there is some influence of the solar cycle on ULF wave frequencies. The interval of the data is between interval covers from the the declining phase solar cycle 23 (between 2005-2007) to the declining phase of cycle 24 (2008-2016), as it is possible to observe in Figure 4.6. This data set allowed us to analyze if there is some variation of those frequencies with the solar variation.

Figure 4.6- Sunspots progression number and MEX interval used in this study.

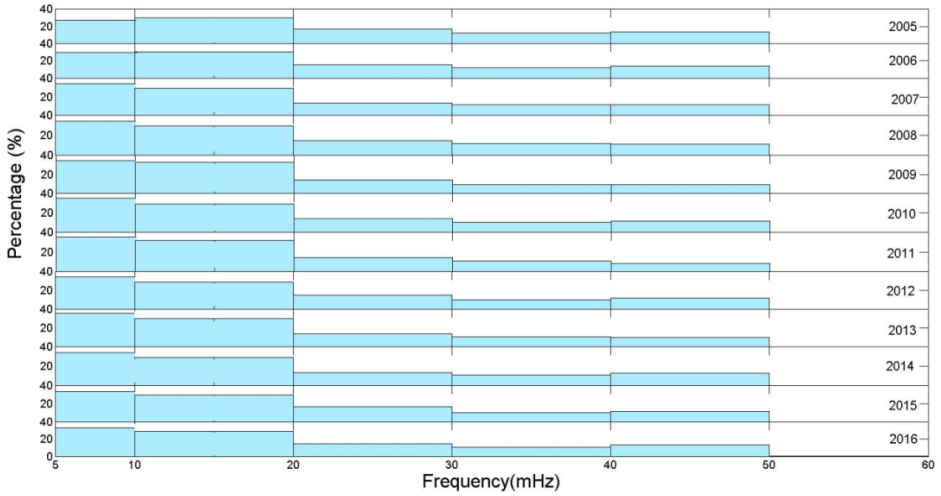


Source: NOAA (2016).

In order to develop this study, the results that were shown at the previous section were divided by year and a histogram was obtained for each Earth year. Figure 4.7 shows histograms of the frequencies for electron density from year

by year from 2005 to 2016. In this Figure, we cannot observe any clear variation with the solar cycle.

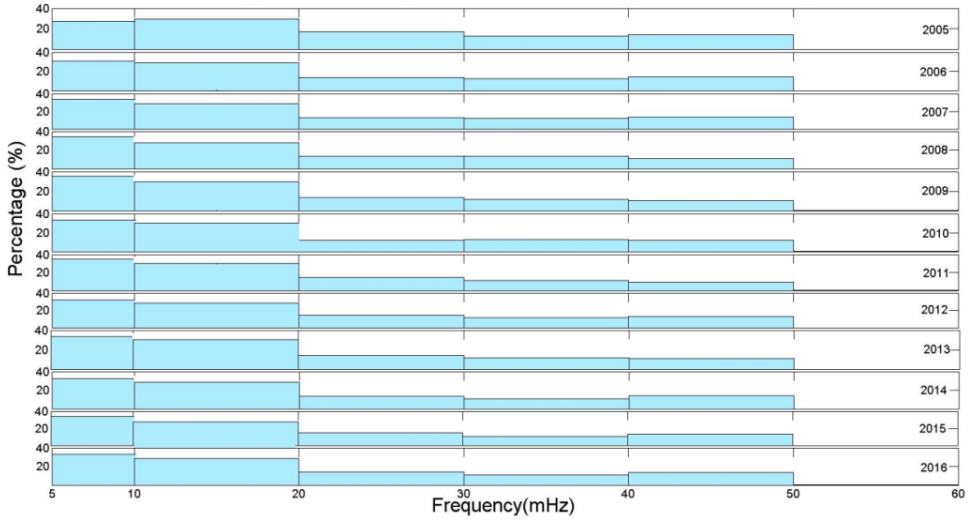
Figure 4.7 Histogram of electron density for all analyzed years (2005-2016).



Source: Author production

In the same way, histograms with the frequencies of the electron temperature by year are presented in Figure 4.8, and again no clear dependence with solar cycle is observed.

Figure 4.8 Histogram of electron temperature for all analyzed years (2005-2016).

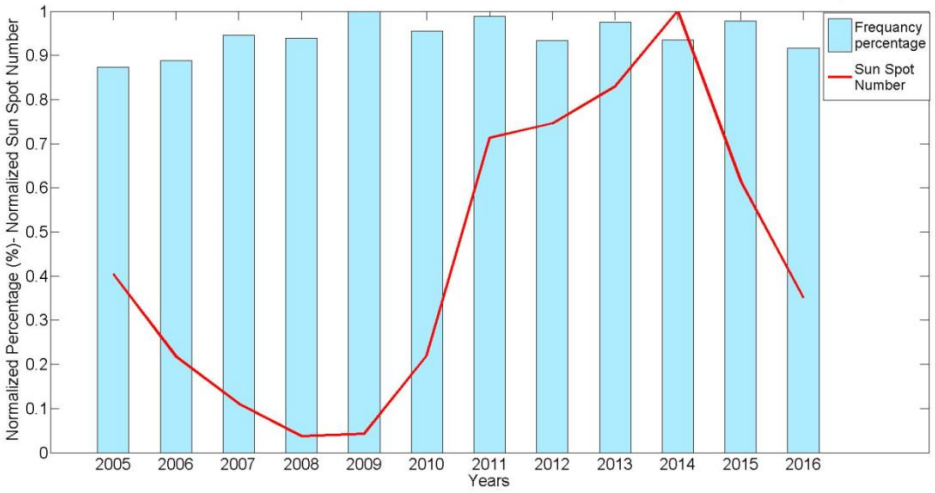


Source: Author production

After analysing all frequencies ranges of this study, possible variations with solar cycle have been saerching only in the main frequencies (5-20 mHz). This

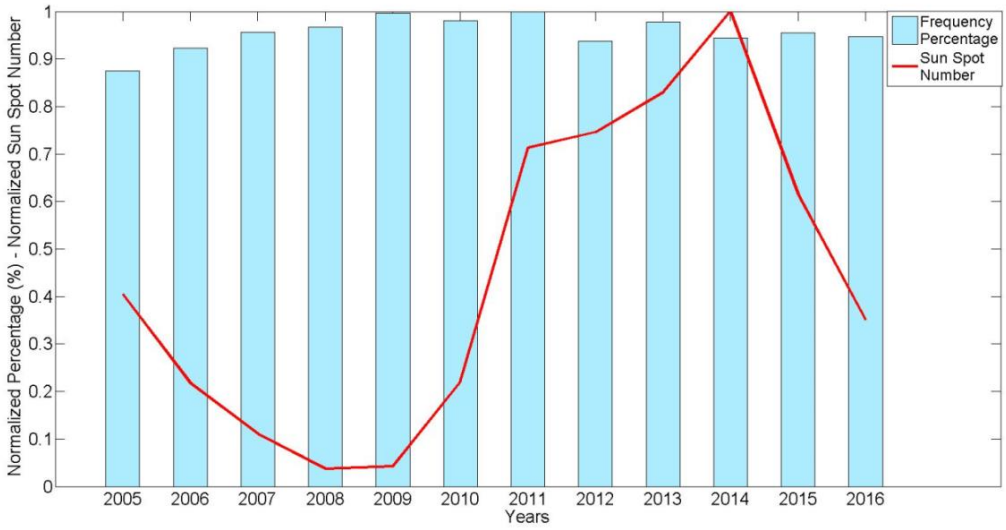
shown in Figure 4.9 for electron density and in Figure 4.10 for electron temperature. The normalized percentage of frequencies in that range for each year and the normalized average Sunspot number (red curve) are plot in the figures. Again we do not observe any significant variation with the solar cycle.

Figure 4.9- Histogram with the normalized percentage of the main frequencies (5-20 mHz) on electron density fluctuation by year (2005-2016) and average Sunspot number in red line.



Source: Author production.

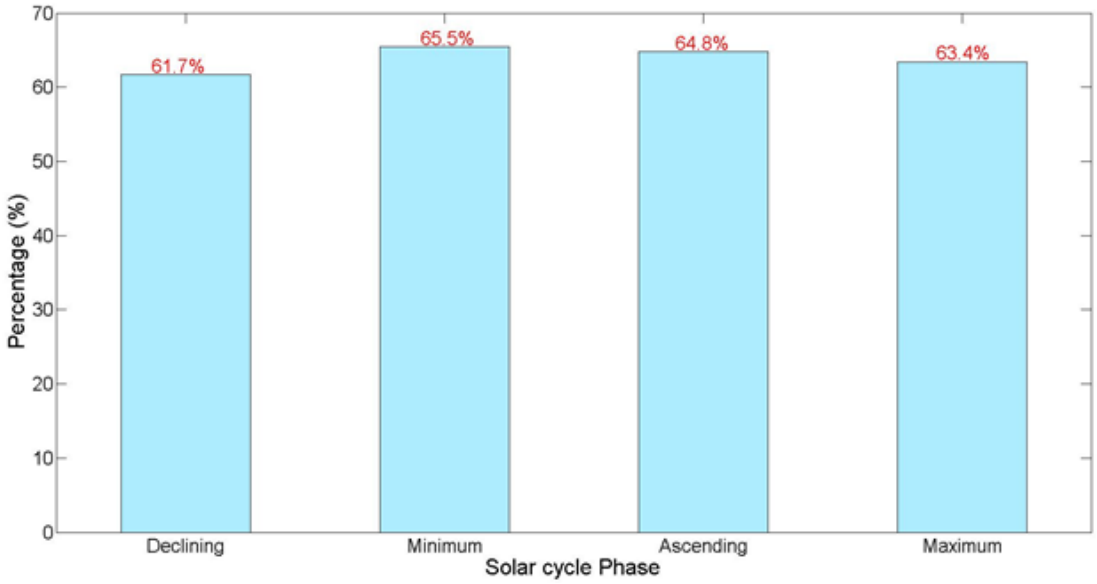
Figure 4.10- Histogram with the normalized percentage of the main frequencies (5-20 mHz) on electron temperature fluctuation by year (2005-2016) and average Sunspot number in red line.



Source: Author production.

In the final analysis, the main frequencies were divided in subintervals according to the solar cycle phases. The results for electron density are shown in Figure 4.11. The declining phases (include 2005, 2006, 2007 (23 cycle) and 2015, 2016 (24 Cycle)) have 61.7% of the frequencies identified in the interval 5-20 mHz. The minimum phase (2008 and 2009) has 65.5% in that range of frequencies. During the ascending phase the percentage is 64.8% (2010 and 2011) and while in the maximum (2012, 2013 and 2014) it is 63.4%.

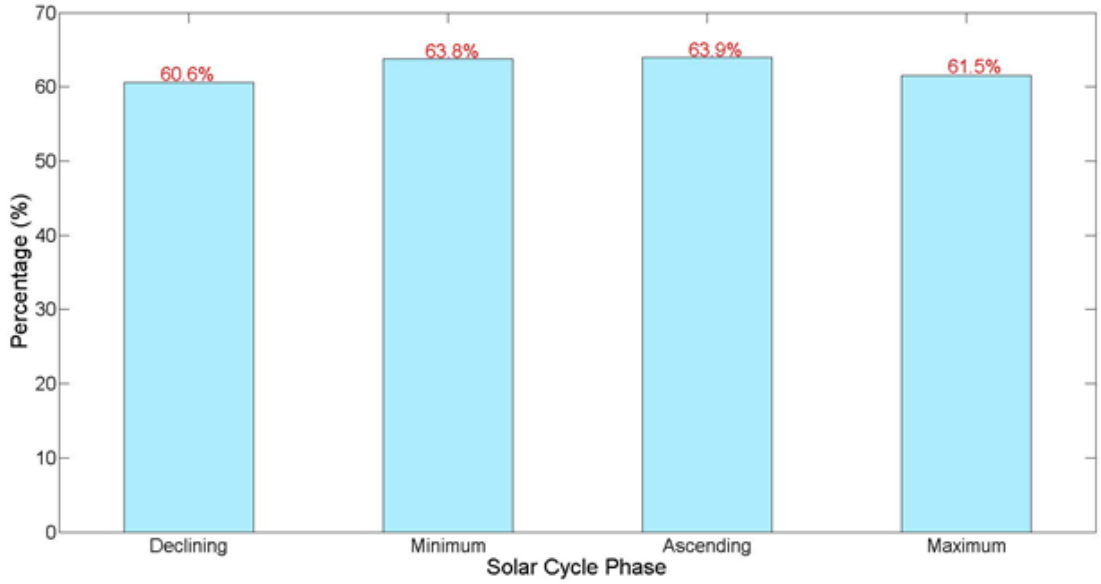
Figure 4.11- Histogram with electron density ULF wave in the range 5-20 mHz for each solar cycle phase (2005-2016).



Source: Author production.

For electron temperature (Figure 4.12) a similar result has been found. During declining phases, 60.6% of the frequencies identified are in the interval of 5-20 mHz. During the minimum phase, 63.8% are in that range of frequencies. In the ascending and maximum phases, 63.9% and 61.5% are in that range, respectively. In Figure 4.11 and Figure 4.12 no significant difference in the percentage of the frequencies with solar cycle phases can be observed.

Figure 4.12- Histogram with electron temperature ULF wave in the range 5-20 mHz for each solar cycle phase (2005-2016).



Source: Author production.

After all these analyses it is possible to conclude that there is no influence of solar cycle on the frequencies of ULF waves in the magnetosheath of Mars. Vignes et al. (2000) have shown that the bow shock and the MPB of Mars positions are independent of the phases of the solar cycle, corroborating our findings. It is believed that it occurs due to the fact that although mass loading plays an important role in the magnetosphere of Mars (due to the extent of the Martian exosphere), the magnetosphere of Mars is not very sensitive to the increase in mass loading by an increase in solar EUV (which increases with the solar activity) (BRAIN, 2004). Since the boundaries of the magnetosheath (bow shock and MPB) do not suffer significant influence of the solar cycle, this may justify why the main frequencies in this region are almost the same for all solar cycle phases.

In addition, for ion cyclotron wave mechanisms, the variation of the ions gyrofrequency is important. As it was seen, the frequencies obtained here are near the O^+ gyrofrequency. The main factor that controls the ion gyroradius is the interplanetary magnetic field that is compressed around the planet. From

the OMNI data, at 1 AU, the variation of the magnetic field between the period of minimum activity (2006-2009, magnetic field= 4.2 nT) and of maximum activity (2013-2014, magnetic field= 5.7 nT) was $\sim 35\%$. As MEX does not have a magnetometer, the variation in the magnetic field near the planet could not be computed. However considering the same difference in magnetic field from solar minimum to solar maximum at 1.5 AU (Mars orbit) and considering the frequency peak of 7.5 mHz, a variation of 35% corresponds to a difference of ± 2.62 mHz (from 4.88 mHz to 10.1 mHz). Thus, it cannot change the frequency significantly enough, since it still falls into the same range of frequency (5-10 mHz) of the analysis.

4.1.3 Correlation Length Analysis

For Mars the analyses of the correlation length (CL) of structures around the planet was done using data from two spacecraft, MEX and MAVEN. For MEX, electron density data from 2004 to 2015 and for MAVEN, electron and magnetic field magnitude data, for the period between 2014 and 2016, have been used. The CL was calculated for temporal and spatial scales. An analysis during high and low solar wind dynamic pressure intervals has also been done. The results will be shown in the next subsection divided by results for each spacecraft.

4.1.3.1 MEX –Particles (electron density)

As it was mentioned before, MEX does not have a magnetometer. Thus, the CLs for its data were calculated only for electron density data.

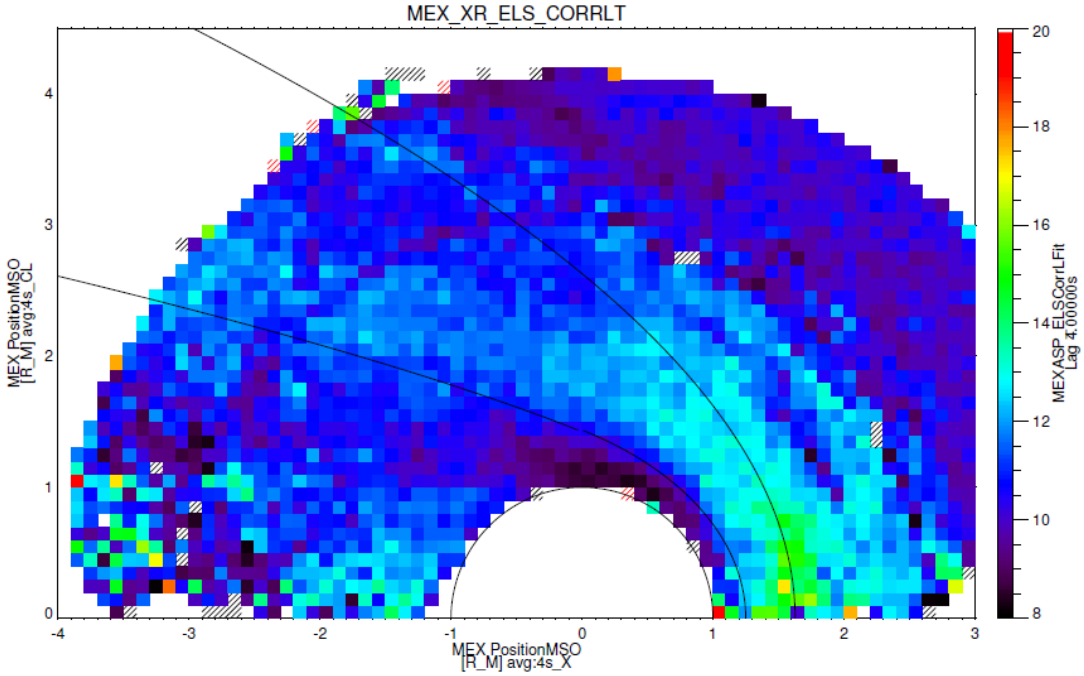
4.1.3.1.1 Temporal Scale

The plots have been made using MEX plasma moment data from April, 2004 to December, 2015 (CDF formatted files are available with a daily resolution at the ASPERA-database of the MPI for Solar System Research). Each bin has a dimension of 0.1x 0.1 Mars radius in cylindrical MSO (Mars Solar Orbit) coordinates. The main localization of the boundaries of the Mars magnetosphere found by Han et al. (2014) is shown in figure 4.13. The CLs are represented in color scale, which varies between 8 and 20 seconds. Dashed red bins represent regions where CLs are higher than the maximum value of the scale, black dashed bins when it is lower and white bins regions where there is

not data available. The x-axis represents the Mars-Sun line and is centered in Mars, and it varies from -4 R_M to 3 R_M. Y-axis represents the y direction and varies from 0 to 4.5R_M.

For the temporal scale, it is possible to observe CLs of about 13.5-14 seconds in the solar wind. The bow shock cannot be observed clearly by the CL values and at the boundary (dayside) it presents values between 14 and 15 seconds. At the dayside of the magnetosheath the CL varies between 15.5-17 seconds. At the nightside of the magnetosheath, the dominant CL is around 12 seconds. At the MPB dayside, values around 13-13.5 seconds can be observed, but in the nightside, the same CL values of the nightside magnetosheath (12 seconds) are observed. In the magnetotail the CL varies between 13 and 15 seconds.

Figure 4.13- Correlation lengths around Mars in temporal scale for the MEX electron density data (2004-2014).



This shows the number of samples per spatial bin in cylindrical coordinates in the MSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Han et al. (2014) are also plotted.
Source: Author production.

Most part of outflow particles is observed in the region of the magnetotail of Mars (LUNDIN et al., 2006). High CL values observed in the magnetotail may

be related to the tail ion beams with energy similar to the solar wind protons (BARABASH et al., 2004; LUNDIN et al., 2006). It is also possible to observe high values of CLs at the nose of the planet, from the solar wind to lower regions of the magnetosheath, which may be correlated to wave penetration into the atmosphere of Mars.

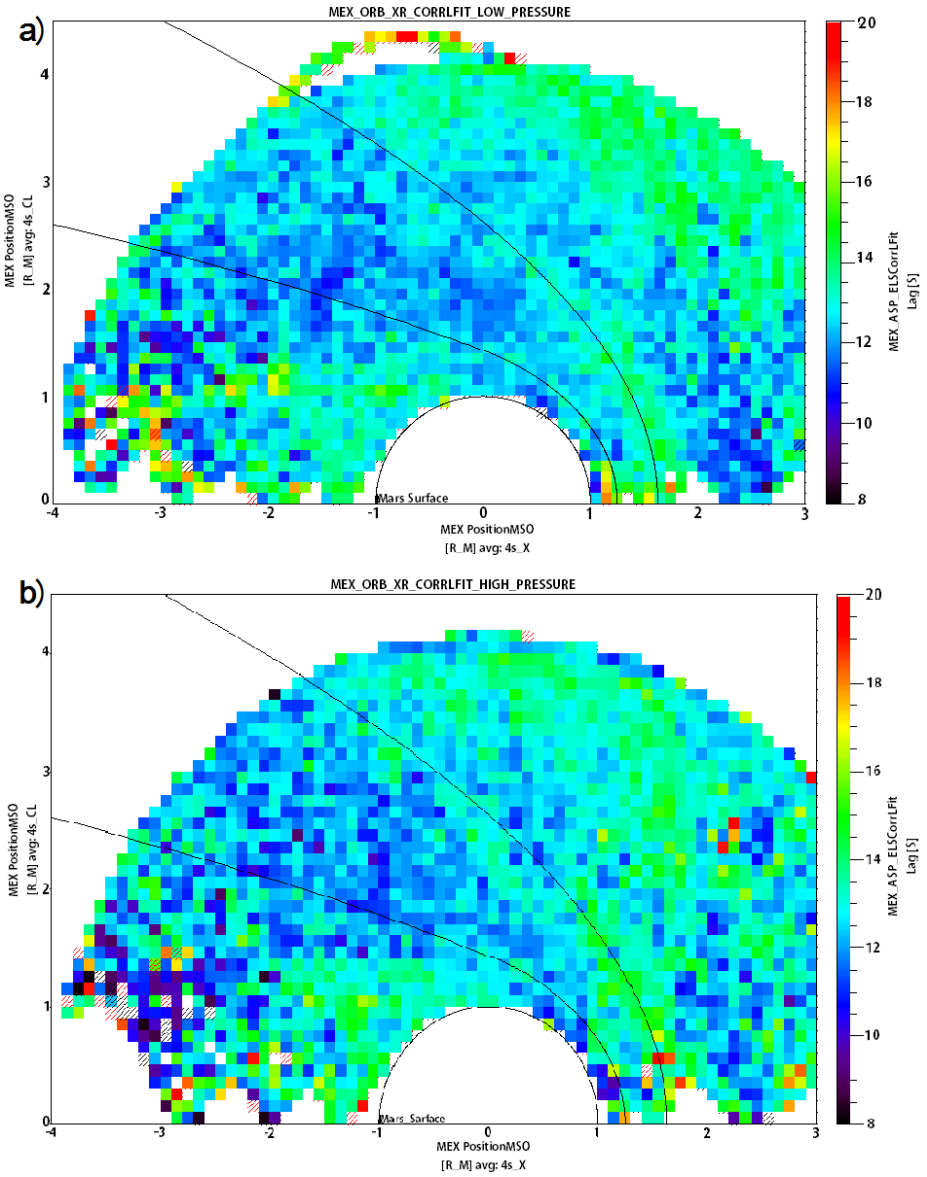
4.1.3.1.1.1 Low and High Solar Wind Pressure Conditions

When the dynamic pressure of the solar wind is high, it increases the wave production in the magnetosheath (LUNDIN et al., 2008). In order to analyze if the size of the structures around the planet change with the solar wind pressure, we have performed a study of the CL during periods of low (between 0 nPa and 1 nPa) and high (between 1 nPa and 100 nPa) solar wind pressure values for the whole interval of the analysis. The solar wind pressure has been determined from daily and 12h averages of the upstream MEX/IMA ion observations. From this dataset we determined time intervals of low and high solar wind pressure. Here, the CLs are also represented in color scale, which varies between 8 and 20 seconds.

Figure 4.14 presents the comparison of the CL values in temporal scale during low (a) and high (b) solar wind pressure intervals. It is important to mention that for this analysis a few number of data have been used, 52 intervals for high pressure and 153 for low pressure. That difference occurs because IMA data is used for SWP analysis and it has gaps. Looking at the figures (4.14-a) and 4.14-b)) it is clear that during high solar wind pressure intervals (4.14-b), larger CL can be observed in all regions. But during periods of low solar wind pressure (4.14-a), CLs values with high values are observed mainly in the inner regions of the magnetosphere, dayside MPB (~17-18.5 seconds) and tail (15-18 seconds). Almost the entire magnetosheath presents the lower values of length, with about 11-12 seconds except for the dayside, where CLs can reach values between 15.5-17 seconds. At the bow shock (subsolar region), the CL can reach 17 seconds. Another important observation is that high values of CL in the tail are observed closer to the planet during periods of high solar wind

pressure than during periods of low pressure. These differences between low and high solar wind pressure may indicate that either the heavy ion exosphere or reflected ions are able to destroy ULF wave trains which are transported by the solar wind during low solar wind pressure.

Figure 4.14- Correlation lengths around Mars in temporal scale for the MEX electron density data for periods of low (a) and high (b) solar wind pressure.



These plots show the number of samples per spatial bin in cylindrical coordinates in the MSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Han et al. (2014) are also plotted.
Source: Author production.

In this analysis is possible to notice that the bow shock moves toward the planet during periods of high solar wind pressure (Figure 4.14-b)), which agrees with the results of other works (TROTIGNON et al., 1993; SCHWINGENSCHUH et al., 1992; RUHUNUSIRI et al., 2015b; HALEKAS et al., 2016; RAMSTAD et al., 2017).

Lundin et al. (2008) have shown that planetary ion escape rate grows with the increase of the solar wind pressure, and that the solar wind pressure probably controls the enhanced energy and momentum. ULF waves intensity is observed to be directly correlated with solar wind dynamic pressure (LUNDIN et al., 2011). Thus, high values of CL observed in the whole magnetosphere during periods of high solar wind pressure also show the importance of the ULF waves in the escape of atmospheric ions from Mars.

Table 4.3 shows a summary with the CLs of electron density (MEX) in temporal scale in the main regions and boundaries of the Mars magnetosphere.

Table 4.3- Maximum values of correlation length (electron density, MEX) in temporal scale in plasma boundaries and regions of the Martian Magnetosphere.

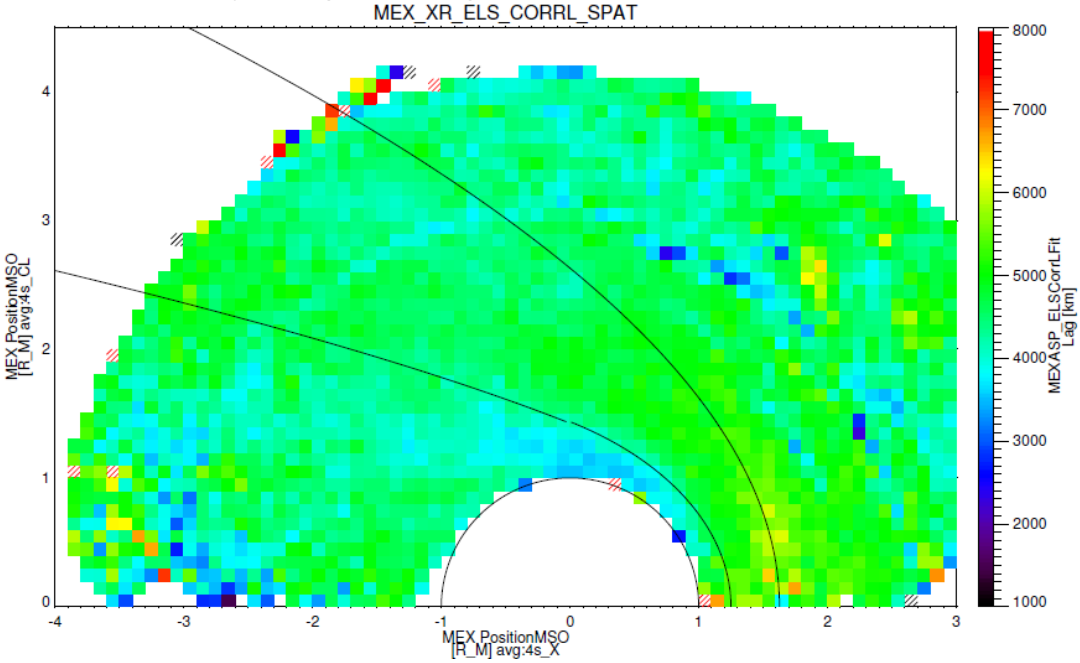
Correlation length in temporal scale (Seconds)					
Regions	Solar Wind	Bow Shock (Dayside)	Magnetosheath (Dayside)	MPB (Dayside)	Tail
Total	13.5-14	14-15	16-17	13-13.5	13-15
High pressure	14-16	16.5-19	17- >20	16.18	>20
Low pressure	11.5-13	14-17	15.5-17	17-18.5	15-18

4.1.3.1.2 Spatial Scale

Figure 4.15 shows the CL in spatial scale. The color scale here represents the CL in kilometers with the scale varying between $1x10^3$ to $8x10^3$ km. In spatial

scale the CLs are lower in the inner terminator region, where they have values around $3.8x10^3$ km. In the solar wind the CL shows values between $5.5x10^3$ and $6.5x10^3$ km. At the magnetosheath the CLs around $5.9x10^3$ km are observed in the dayside, while at the nightside CL shows values around $5x10^3$km. In the magnetotail region the dominant CLs are also around $5x10^3$km, but large CLs, around $7x10^3$ km, can be observed in regions more distant to the planet. In the nose of the planet, CLs at the bow shock, MPB boundaries and magnetosheath show high values in a significant region, which vary between $5.5x10^3$ and $6.8x10^3$ km.

Figure 4.15- Correlation lengths around Mars in spatial scale for the MEX electron density data (2004-2014).



This plot shows the number of samples per spatial bin in cylindrical coordinates in the MSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Han et al. (2014) are also plotted.
Source: Author production.

In spatial scale, CL is clearly larger in the region of the magnetosheath, mainly at the nose of the planet. Espley et al. (2004) have shown that transversal waves are the dominant wave mode at the nightside of the magnetosheath, whereas compressional waves are dominant at the dayside. They associated these waves to Martian exosphere new pickup ions (relatively cold), which with interaction with the solar wind protons produces oscillations in the magnetic

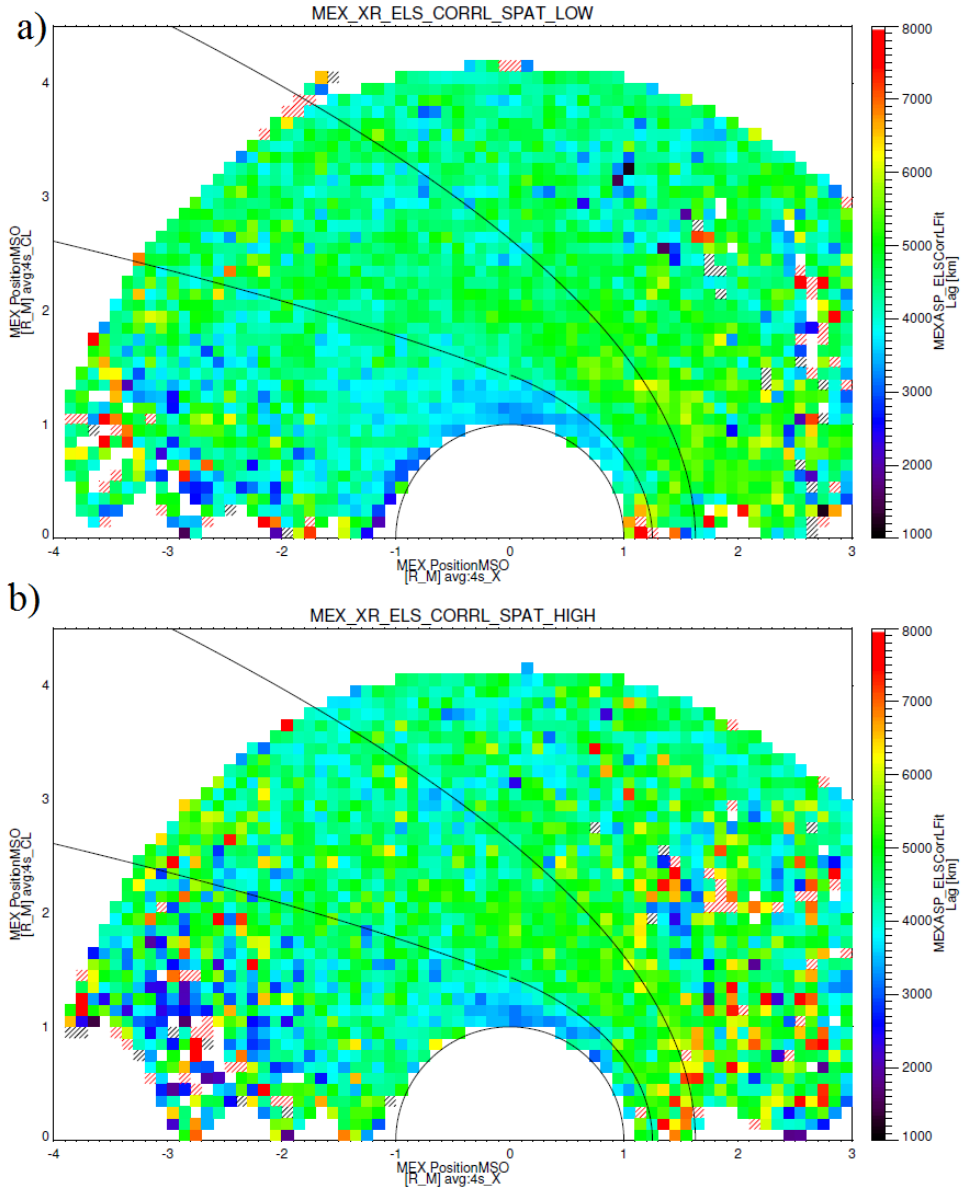
field. Ruhunusiri et al. (2015a) observed that the Alfven wave is the wave mode dominant in the magnetosheath of Mars. These waves can propagate in the magnetosphere, and they may be able to penetrate into the MPB (LUNDIN et al., 2011; RUSHNUSIRI et al., 2015a).

An important factor are the large CLs observed at the nose of the planet. Those values are observed through the magnetosheath until the inner atmosphere. It indicates that waves at the magnetosheath can be correlated to oscillations in the ionosphere. This may means that, in a local region, wave trains from the magnetosheath cause resonance effects at the planetary ionopause, in a way that the ionospheric plasma responds to these oscillations. These waves can transfer energy to planetary ions that are accelerated and gyre out from the planet in resonance with fluctuations generated in the interaction with solar wind. Consequently, this process would be important for the enhancement of ion escape from the atmosphere of Mars.

4.1.3.1.2.1 Low and High Solar Wind Pressure

The analysis of low and high solar wind pressure intervals in spatial scale are presented in Figure 4.16 (a and b), respectively. As it was observed in Figure 4.14 (temporal analysis), during the periods of high pressure (Figure 4.16-b)), except for the MPB, CLs are larger in all regions if compared with periods of low pressure (Figure 4.16-a)). During low solar wind pressure intervals, although the dominant CLs are about $5.5x10^3$ km, large values of CL can be observed at the dayside below the MPB (around $6.8x10^3$km), which is also observed in small regions at the magnetosheath and solar wind. At the bow shock the CL is about $5.7x10^3$ km. The dominant CL seen at the MPB is around $4.2x10^3$ km, but in a small region in the nose of the planet, it can vary between $6x10^3$ km and $6.3x10^3$km. In the tail region, a small number of bins are observed with high CL (higher than $7.5x10^3$km). The predominant values in the whole tail is around $5.8x10^3$km.

Figure 4.16- Correlation lengths around Mars in spatial scale for the MEX electron density data for periods of low (a) and high (b) solar wind pressure.



These plots show the number of samples per spatial bin in cylindrical coordinates in the MSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Han et al. (2014) are also plotted.
Source: Author production.

In periods of high pressure (4.16-b)) the number of bins with high values are larger than during periods of low pressure. It is also more distributed and can be observed far away from the center of the tail (where it is more frequently during low pressure). Large CL values can be observed at the solar wind ($7x10^3$ –

$7.8x10^3$ km), bow shock ($6.6x10^3 - 7.3x10^3$km) and dayside of the magnetosheath (7.2-7.7$x10^3$ km). At the MPB, it is about $5.5x10^3$km, which is smaller than during low pressure (as mentioned above).

Table 4.4 shows the CLs of electron density (MEX) in spatial scale in the main plasma boundaries and regions of the Magnetosphere of Mars.

Table 4.4- Maximum Values of correlation length of electron density (MEX) in spatial scale in each plasma boundaries and regions of the Magnetosphere.

Correlation length in spatial scale (km)					
Regions	Solar Wind	Bow Shock	Magnetosheath (Dayside)	MPB(Dayside)	Tail
Total	$5.5x10^3$- 6. $5x10^3$	$6.3x10^3$	$5.7x10^3$- $6x10^3$	$6.4x10^3$- $6.8x10^3$	$6.5x10^3$ - $7.5x10^3$
High SW pressure intervals	$7x10^3$- $7.8x10^3$	$6.6x10^3$- $7.3x10^3$	$7.2x10^3$- $7.7x10^3$	$5.5x10^3$	$7x10^3$- $8x10^3$
Low SW pressure intervals	$5.7x10^3$	$5.8x10^3$	$5.8x10^3$- $5.9x10^3$	$5.8x10^3$- $7.5x10^3$	$6.7x10^3$ - $7.3x10^3$
Ratio ($\frac{HSWP\ CL}{LSWP\ CL}$)	1.3	1.20	1.3	0.83	1.1

It is important to mention that in spatial scale, the CL is computed using solar wind velocity and that can affect CL values during periods of high pressure intervals, since the fluctuations in this parameter increase. But it is also important to point the fact that an increase in the CL during high pressure was also observed in the temporal analysis, which is computed without using solar wind velocity.

The correlation length values obtained here were compared with the mean size of the magnetosheath and MPR. Table 4.5 shows that comparison, where the

size of the plasma regions, obtained from the difference between the location of the plasma boundaries; bow shock (VIGNES et al., 2002), MPB (NAGY, 2004) and ionopause (TROTIGNON et al., 2006). The CL and the ratio between them are also presented.

Table 4.5- Comparison of the highest correlation length in the plasma region of the magnetosphere of Mars with their sizes.

Regions	Size (km)	Correlation length (km)	Correlation length/Size
Magnetosheath	$1.29X10^3$	$6.0X10^3$	4.65
MPB/ MPR	$2.72X10^2$	$6.8X10^3$	25

CL at the dayside of the magnetosheath is approximately five times the magnetosheath size, whereas CL at the MPB/MPR is 25 times larger than that region, which can be considered another indication that wave fluctuations at the magnetosheath and MPR are correlated with oscillations at the ionosphere, due to ULF waves that can penetrate into the ionopause, as it was discussed before.

4.1.3.2 MAVEN

The analyses of the MAVEN data have been performed for the interval from November 2014 to December 2016. As MAVEN has a magnetometer onboard, besides the electron density analysis, CL in magnetic field has been also calculated. The analysis here is presented in temporal scales. Due to the smaller temporal coverage (2014-2016) for MAVEN compared with MEX data, the analysis of the CL with the variation of solar wind pressure cannot be done.

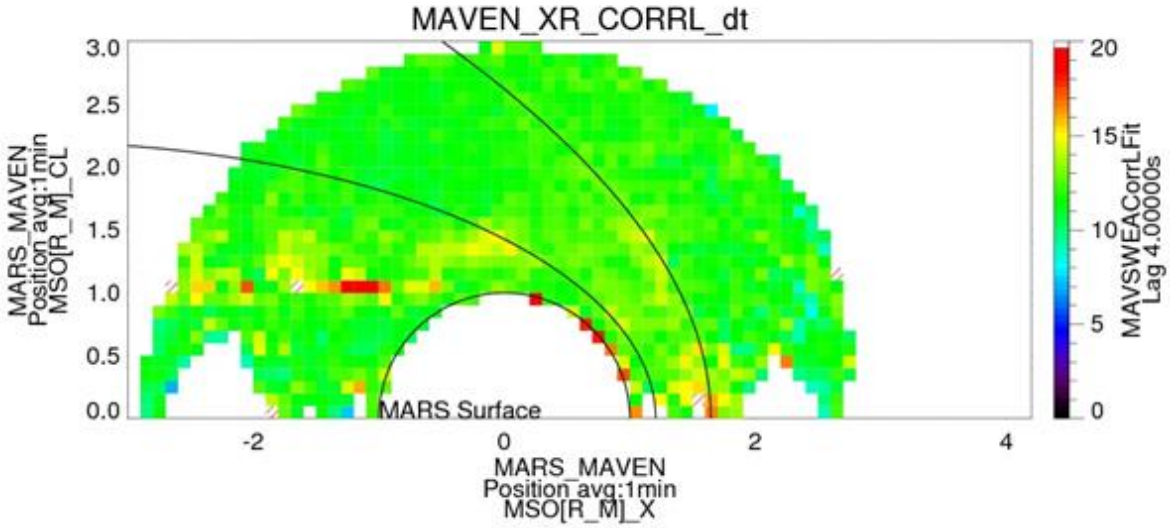
4.1.3.2.1 Particles (Electron Density)

The electron density data was obtained from the MAVEN electron spectrometer, SWEA. As it was developed for MEX, the results of the analysis are divided in temporal and spatial scales.

4.1.3.2.1.1 Temporal

Figure 4.17 shows the correlation length in temporal scales. The mean plasma boundaries are also shown. In this map, the bow shock can be seen clearly in the CL, which is above 15 seconds. The dominant value of CL in the magnetosphere of Mars is around 12 seconds, but as it was seen for MEX analysis, the region of the subsolar point is dominated by high values in the solar wind (11-15 seconds), bow shock, dayside of the magnetosheath (16 seconds) and MPB (13-15 seconds). In the magnetotail the dominant value is 10 seconds, but regions with CL of 14-16 seconds are also found.

Figure 4.17- Correlation lengths around Mars in temporal scale for the MAVEN electron density data (Nov/2014-Dec/2016).



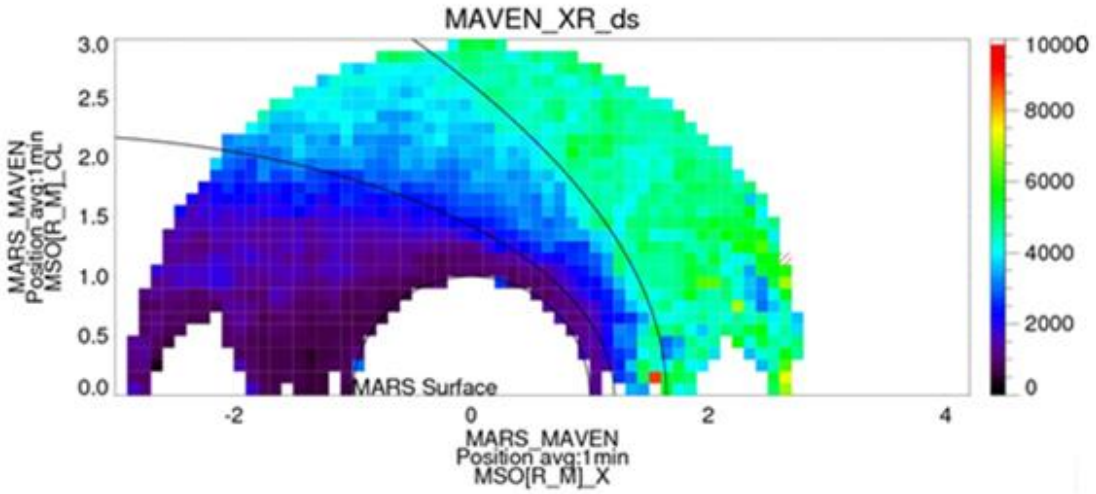
This plot shows the number of samples per spatial bin in cylindrical coordinates in the MSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Han et al. (2014) are also plotted.
Source: Author production.

4.1.3.2.1.2 Spatial

In order to calculate the CL in spatial scale, the solar wind velocity has been obtained from MAVEN ion spectrometer (SWIA). The results of the analysis are shown in Figure 4.18. Here the color scale, that represents the CL in kilometers, varies from 0 to $1.0X10^4$ km. Larger CL values ($5.0x10^3 - 6.0x10^3$ km) are observed in the solar wind. At the plasma boundaries the CL is about $4.0x10^3 -$

$5.0x10^3$ km at the bow shock and $3.0x10^3$ km at the MPB. The magnetosheath shows low values of CL at the most part of the dayside and flank ($2.5x10^3$ km) magnetosphere, but CL around $4.5x10^3 - 5.0x10^3$ km can be observed in the subsolar point. The night side of the magnetosheath shows CLs of $4.0x10^3$ km. In the tail small values are observed, around $2.0x10^3$ km.

Figure 4.18- Correlation lengths around Mars in spatial scale for the MAVEN electron density data (Nov/2014-Dec/2016).



This plot shows the number of samples per spatial bin in cylindrical coordinates in the MSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Han et al. (2014) are also plotted.
Source: Author production.

Table 4.6 shows the comparison of CLs in electron density data for the two spacecraft (MEX and MAVEN) in temporal and spatial scales. Comparing the values of CL found from MEX data in temporal scale with what was found for MAVEN it is possible to notice that the CLs are similar in both analyses. In the spatial analysis CLs are in the same scale, but larger values are observed for the MEX results. It probably occurs due to the fact that the CLs in spatial scale are computed using the solar wind velocity, which can influence the results due to the large fluctuations in that parameter. That can affect more MEX results, since we have a long time (April, 2004-2015) analysis for that spacecraft, as

compared with the MAVEN analysis (November, 2014-2016), and the variation increases depending on the solar cycle.

Table 4.6- Comparison between MEX and MAVEN results of correlation lengths in electron density data.

	Correlation length in temporal scale (Seconds)					
	REGIONS					
		Solar Wind	Bow Shock	Magnetosheath (Dayside)	MPB (Dayside)	Tail
Temporal	MEX	13.5-14	14-15	16-17	13-13.5	13-15
	MAVEN	11-15	15	15-16	13-15	14-16
Spatial	MEX	$5.5x10^3$-$6.5x10^3$	$6.3x10^3$	$5.7x10^3$-$6x10^3$	$6.4x10^3$-$6.8x10^3$	$6.5x10^3$-$7.5x10^3$
	MAVEN	$5.0X10^3$-$6.0X10^3$	$4.0X10^3$-$5.0X10^3$	$4.5x10^3$-$5.0x10^3$	$3.0x10^3$	$2.0x10^3$

4.1.3.2.2 Magnetic Field

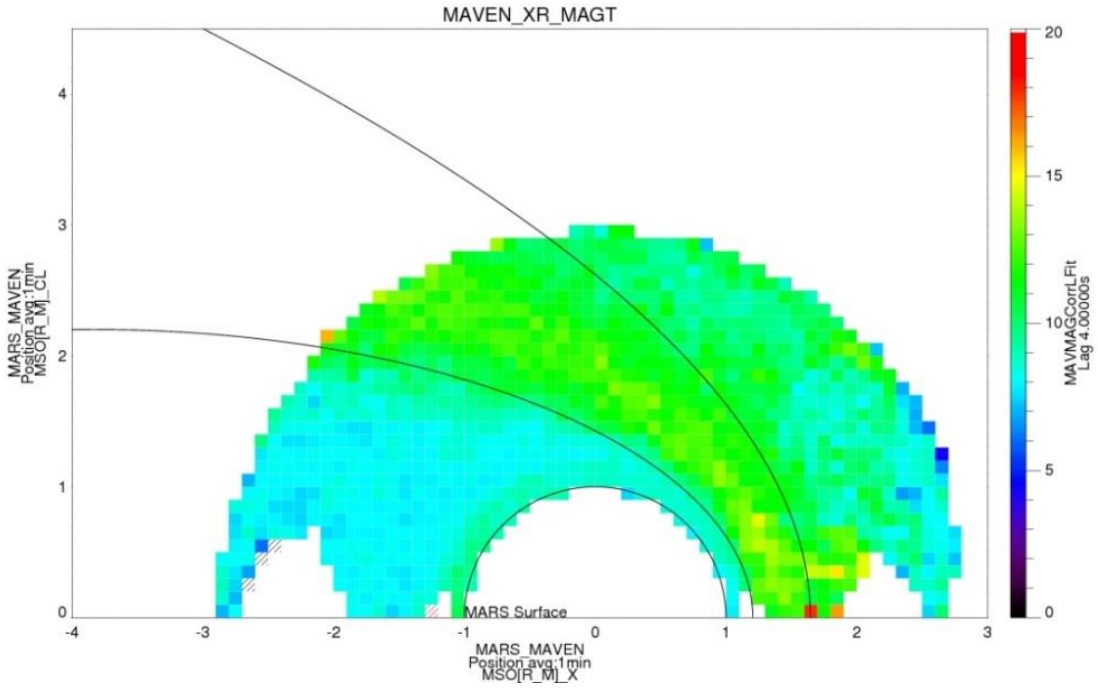
The study of CL in magnetic field data was also divided in temporal and spatial scales and the maps with the result of this analysis are shown in the subsections below.

4.1.3.2.2.1 Temporal

The map with the CL in MAVEN magnetic field around Mars is shown in Figure 4.19. It is possible to notice that the CL is slightly lower in magnetic field than in electron density data. That difference observed between the CLs in the electron density and magnetic field can be caused due to different factors: First, due to the SWEA density measurement depending strongly on spacecraft altitude and solar illumination (via spacecraft potential), which can affect the results. The second, a physical explanation, is that, there are more rotational Alfven waves

in the solar wind plasma which are not visible in total magnetic field (transversal Alfvenic waves), but may still affect the electron distribution.

Figure 4.19- Correlation lengths around Mars in temporal scale for the MAVEN magnetic field data (Nov/2014-Dec/2016).



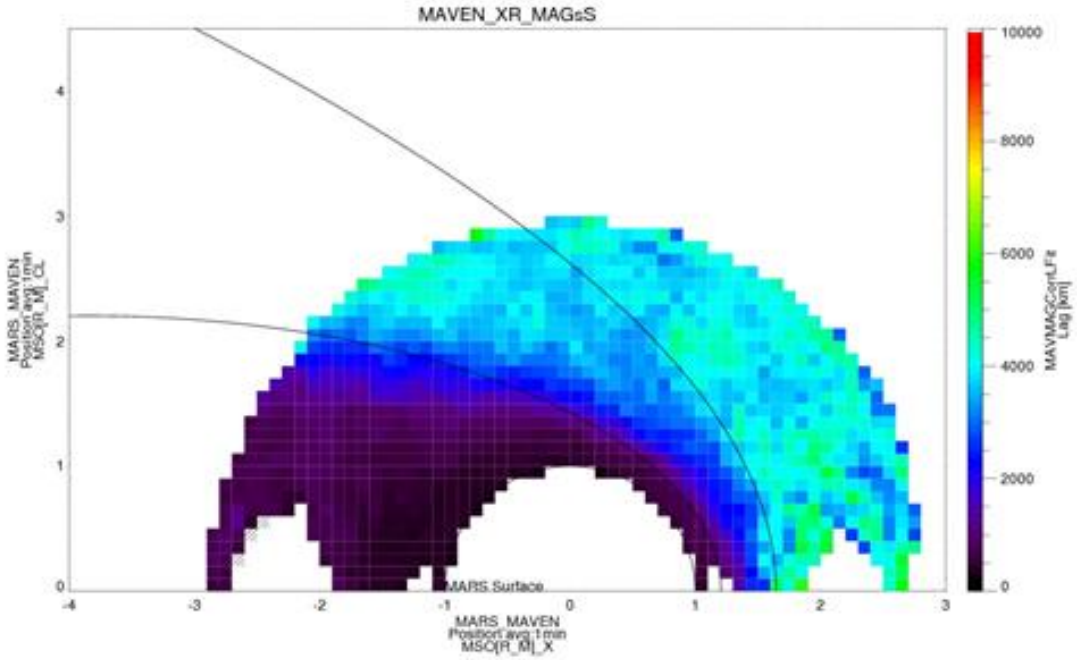
This plot shows the number of samples per spatial bin in cylindrical coordinates in the MSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Han et al. (2014) are also plotted.
Source: Author production.

The region that has a larger CL domain is the magnetosheath, where CLs are about 13-15 seconds. In solar wind CLs around 13 seconds are also observed, but the dominant values are 8-9 seconds. The bow shock cannot be clearly observed here as it was observed in the electron density analysis, and it shows CL of 12 seconds. At the MPB, the CL is around 8 seconds, the same values observed at the tail.

4.1.3.2.2.2 Spatial

In spatial scale a similar map of the electron density data is observed in spatial analysis of CL in magnetic field (Figure 4.20), but again, in a small scale.

Figure 4.20- Correlation lengths around Mars in spatial scale for the MAVEN magnetic field data (Nov/2014-Dec/2016).



This plot shows the number of samples per spatial bin in cylindrical coordinates in the MSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Han et al. (2014) are also plotted.
Source: Author production

The characteristic CL in solar wind here varies between $4.0x10^3 - 5.0x10^3$ km. Similar values are observed at the nighside of the magnetosheath and bow shock. At the dayside, the dominant CL in the magnetosheath is around $2.0X10^3$km. MPB shows CL of about $1.5x10^3$ km and in the tail, where the small CL is observed, it varies between $1.5x10^3$ and $2.0x10^3$ km.

The CLs that were found in the plasma boundaries/regions of Mars in the MAVEN analysis are summarized in the Table 4.7. In the table the results for electron density and magnetic field CLs are shown, both in temporal and spatial scale.

Table 4.7- Correlation length in the electron density and magnetic field data around Mars for MAVEN results.

	Correlation length around Mars (MAVEN data)					
	Regions					
		Solar Wind	Bow Shock	Magnetosheath (Dayside)	MPB (Dayside)	Tail
Electron Density	Temporal (seconds)	11-15	15	15-16	13-15	14-16
	Spatial (km)	$5.0X10^3$ - $6.0X10^3$	$4.0X10^3$ – $5.0X10^3$	$4.5x10^3$ – $5.0x10^3$	$3.0x10^3$	$2.0x10^3$
Magnetic Field	Temporal (seconds)	8-9	12	15	8	8
	Spatial (km)	$4.0x10^3$ – $5.0x10^3$	$4.0x10^3$	$2.0x10^3$	$1.5x10^3$	$1.0x10^3$ – $1.5x10^3$

The CL in the magnetic field and electron density from MAVEN are 3 order of magnitude lower than the CL found close to Earth ($2x10^6\,Km$) in the interplanetary magnetic field fluctuations, the same which was observed in electron density from MEX (JOKIPII; COLEMAN, 1968; WICKS et al., 2010).

The sizes of the magnetosheath and MPR were also compared with CLs (electron density and magnetic field) obtained for MAVEN analysis, the same method to obtain the size of the plasma regions in the MEX analysis was used here and the result of the comparison are present in Table 4.8. Again, although the ratio between CL and plasma region smaller than the ratio obtained for MEX (which as explained due to the high fluctuations in solar wind velocity), it was seen that CLs are larger than the plasma regions, even in the magnetic field data.

Table 4.8- Comparison of the highest correlation length in the plasma region of the magnetosphere of Mars with size of them for MAVEN results.

Regions	Size (km)		Correlation length (km)	Correlation length/Size
Magnetosheath	$1.29X10^3$	Electron Density	$5.0X10^3$	3.9
		Magnetic Field	$2.0X10^3$	1.6
MPB/ MPR	$2.72X10^2$	Electron Density	$3.0X10^3$	11.0
		Magnetic Field	$1.5X10^3$	5.5

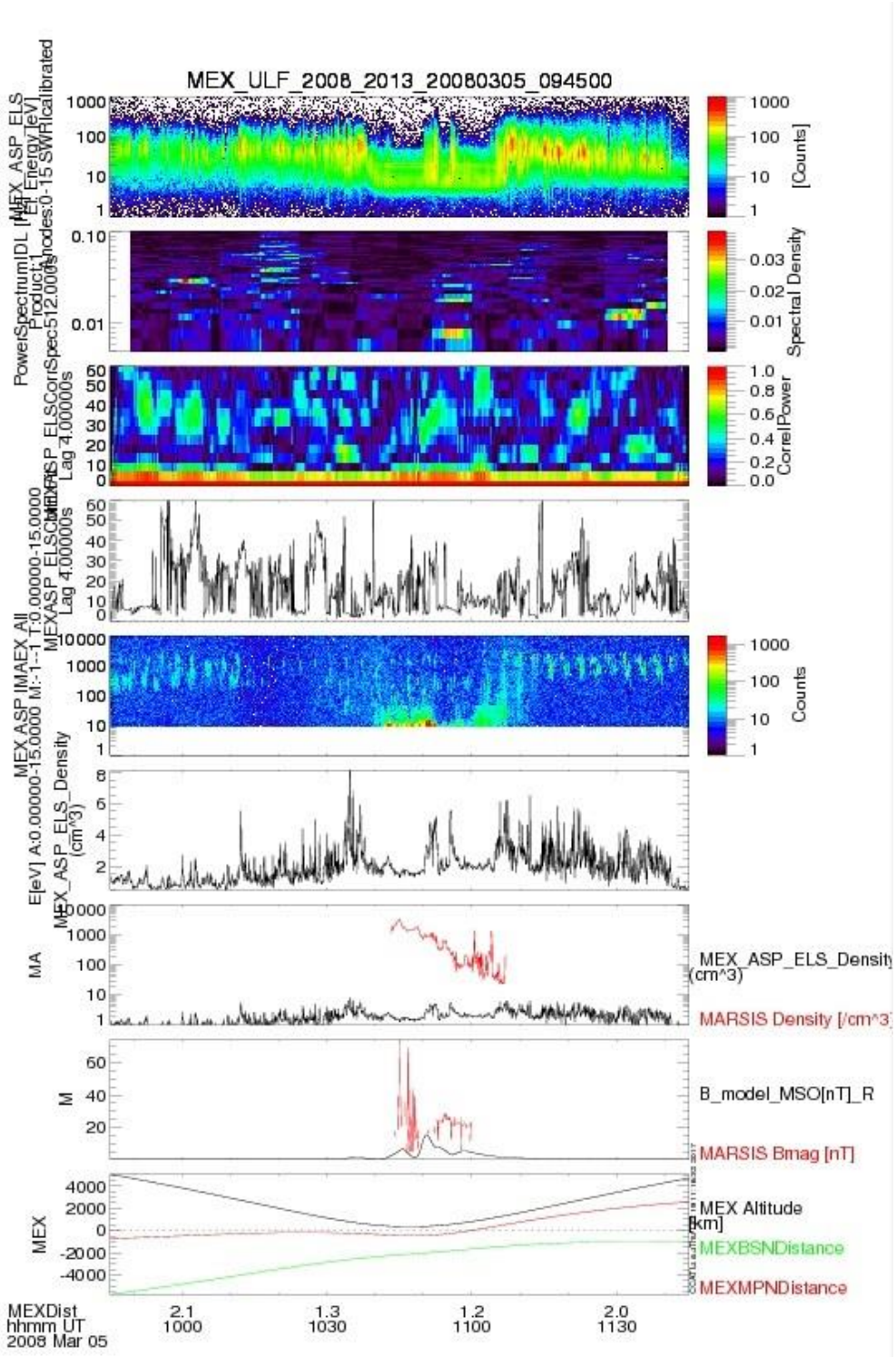
4.1.4 Study of Wave Penetration

In order to investigate cases where the waves on the magnetosheath could penetrate into the ionopause of Mars, plots of a list of plasma and magnetic field parameters have been analyzed from 2005 to 2015. Figure 4.21 shows an example of a potential case. Each plot has 9 panels with: electron energy spectrum, power spectrum, correlation length spectrum, temporal correlation length, ion energy spectrum, MARSIS density (red) and MEX ASPERA-3 ELS electron density (black), MARSIS magnetic field (green) and crustal magnetic field model (red) and MEX altitude and average distance from the bow shock (red) and from MPB (green).

The analysis has been conducted using the following criteria:

- Looking for drops in the counts in the electron spectrum, as it can be seen in the first panel of Figure 4.21. These drops represent the inner region of the magnetosphere of Mars.
- In the power spectrum (Figure 4.21, second panel), search for the frequencies in the range which was identified in the WT analysis for the magnetosheath, in the ionosphere region; which means that the oscillation still propagates across the MPB.

Figure 4.21- Example of a potential case of wave penetration in the ionosphere.



Source: Author production

- Search for high CLs in the spectrum and temporal CL in the ionopause (third and fourth panels of figure 4.21); high values of CL indicate that structures present in the ionospheric plasma are correlated in large temporal/ spatial scales, which can be correlated with oscillations in the magnetosheath region.

- Search events with fluctuations in electron density data from MARSIS and ASPERA-3; MARSIS measures ionospheric electrons and the ELS/ASPERA-3 measures solar wind electron data, which can be observed in the seventh panel of Figure 4.21. Thus, to observe fluctuations in both of them, it could mean that the same oscillations propagate through the magnetosheath until the ionospheric region.

- The magnetic field from MARSIS data must be higher than the modelled crustal magnetic field (eighth panel of Figure 4.21), to exclude intervals dominated by crustal fields.

After analysis of a total of 428 plots**,** 29 potential cases of wave penetration have been selected. The cases will be better investigated in a future work, where the wavelet and the kurtosis techniques will be employed on them. From those 29 cases, a statistical study has been done in order to search for solar cycle dependence in the occurrence of wave penetration. First of all, the number of events per year has been obtained, as it is shown in Table 4.9.

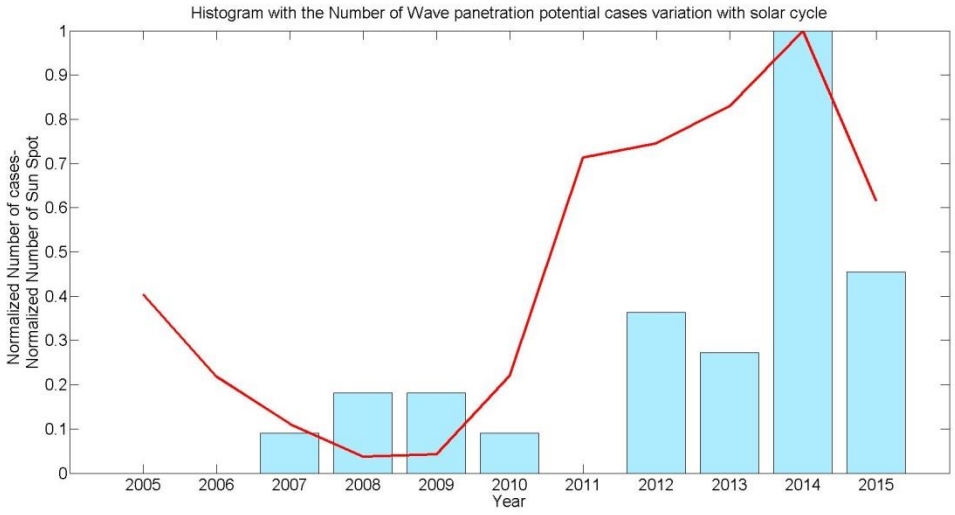
Table 4.9- Number of potential wave penetration cases per year.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of Events	0	0	1	2	2	1	0	4	3	11	5
Number of plots analyzed	10	3	34	66	79	30	56	23	50	43	34

As Table 4.9 shows, the distribution number of plots analyzed by year is not uniform, which could affect in the result. We can notice that the year where

more potential cases are identified do not correspond to the year of more plots analyzed. Then, we can consider this study reliable. In Figure 4.22 a histogram with the normalized number of events per year is plotted. The normalized mean sunspot number per year is also plotted in the figure (red line).

Figure 4.22- Histogram with the Normalized Number of wave penetration potential cases variation with solar cycle. The normalized sunspot number is plotted in red.



Source: Author production.

In Figure 4.22 a clear dependence of the wave penetration with solar cycle can be seen. The year 2014, the year with higher number of sunspots in the interval analyzed, corresponds to the number of most potential cases that are observed, 37.9% of the 29 cases identified.

During maximum solar activity, the EUV flux increases and consequently the exosphere of the planet expands, which can extend beyond the bow shock, facilitating the wave penetration into the ionosphere of the planet. Another possible factor is that, although the frequencies of ULF waves do not change significantly with the solar cycle, the wave power can be intensified due to the high energy present in extreme events that are more frequent during solar maximum.

4.2 Venus

The results of the analyses of plasma waves around Venus are divided in two subsections, the first one was dedicated to present the analysis of CLs around the planet and the second subsection showing the analysis of the distribution of wave modes in Venus.

4.2.1 Correlation Length Analysis

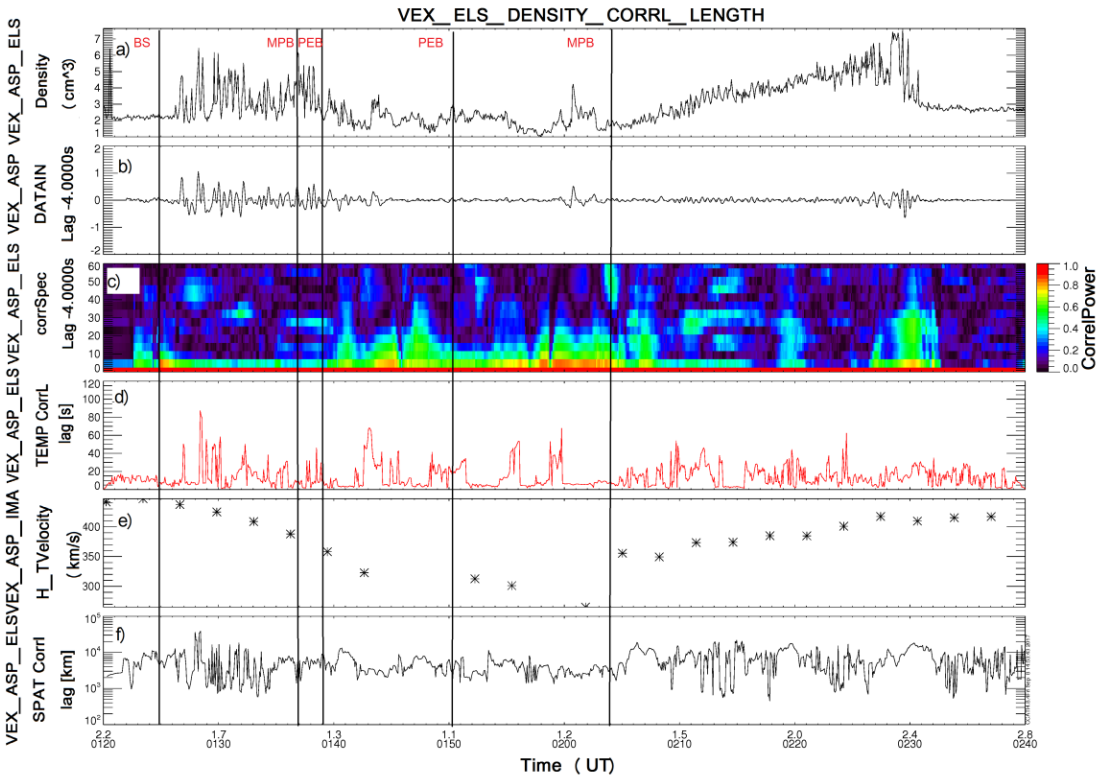
A study of the correlation scale on structures around Venus was developed using electron density and magnetic field data from the mission Venus Express (VEX) for the whole interval of the mission (May 2006 to September 2014). The electron density data were obtained from the instrument ASPERA-4 and the magnetic field data from the magnetometer present in the mission. In order to conduct this work the correlation length was calculated on these time series, similarly as it was done for Mars.

4.2.1.1 Electron Density

Figure 4.23 shows an example of the CL applied to the electron density data from 01:20 UT June 26, 2006 to 02:40, June 26, 2006, using both temporal and spatial scales. Figure 4.23-a) shows the electron density time series; figure 4.23-b) the same time series after the Fourier Transform processing, figure 4.23-c) the correlation spectrum. 4.23-d) the CL in temporal scale. 4.23-e) IMA velocity and in figure 4.23-f) the CL in spatial scale. The black vertical lines represent the plasma boundaries.

In order to investigate the CLs in the electron density around Venus a statistical analysis was applied. For better presentation of the results, they were divided into temporal and spatial analyses.

Figure 4.23- Example of correlation length applied to VEX electron density data.



Source: Author production.

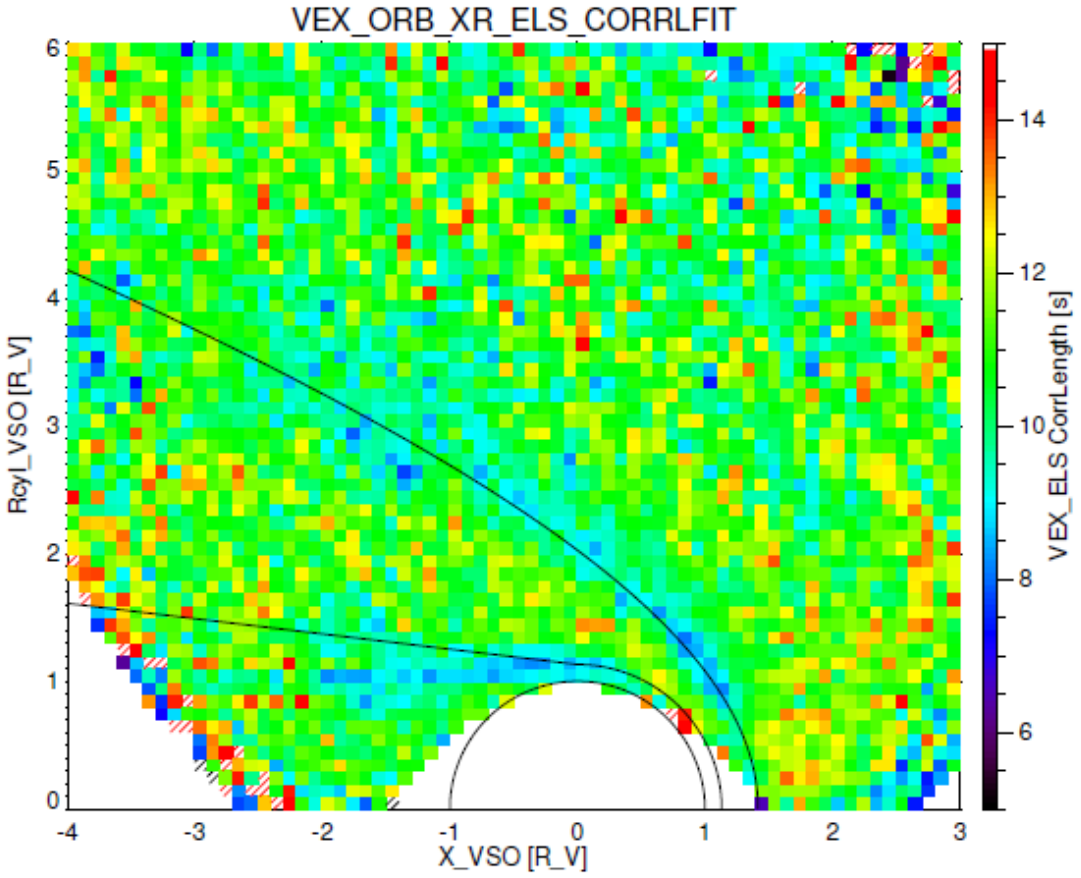
4.2.1.1.1 Temporal

Figure 4.24 shows the median value of the CL in each spatial bin for the electron density in a temporal scale. The plot has been made using all VEX data from May 01, 2006 to September 30, 2014 (based on daily moment data files with 4s time resolution). Each bin has a dimension of 0.1x0.1 Venus radius in cylindrical VSO (Venus Solar Orbit) coordinates. The main localizations of the boundaries of the Venus magnetosphere found by Martinecz et al. (2009) are shown in the figure. The CLs are represented in this figure in color scale and vary between 5 and 15 seconds.

In Figure 4.24 we note that the CL is larger at the dayside of the MPB and in the magnetotail reaching values around 14 seconds in both regions. The bow shock is clearly observed in the map, where small values of CLs are observed (9-10 seconds). In the magnetosheath, values between 11.5 and 12 seconds are

observed at the dayside, while values between 12.5 and 13 seconds are frequently seen in the nightside region. In the solar wind, in the foreshock region, CL values between 12.5-13.5 seconds can be observed.

Figure 4.24- Maps of correlation length around Venus in temporal scale for all VEX electron density data.



This plot shows the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.
Source: Author production.

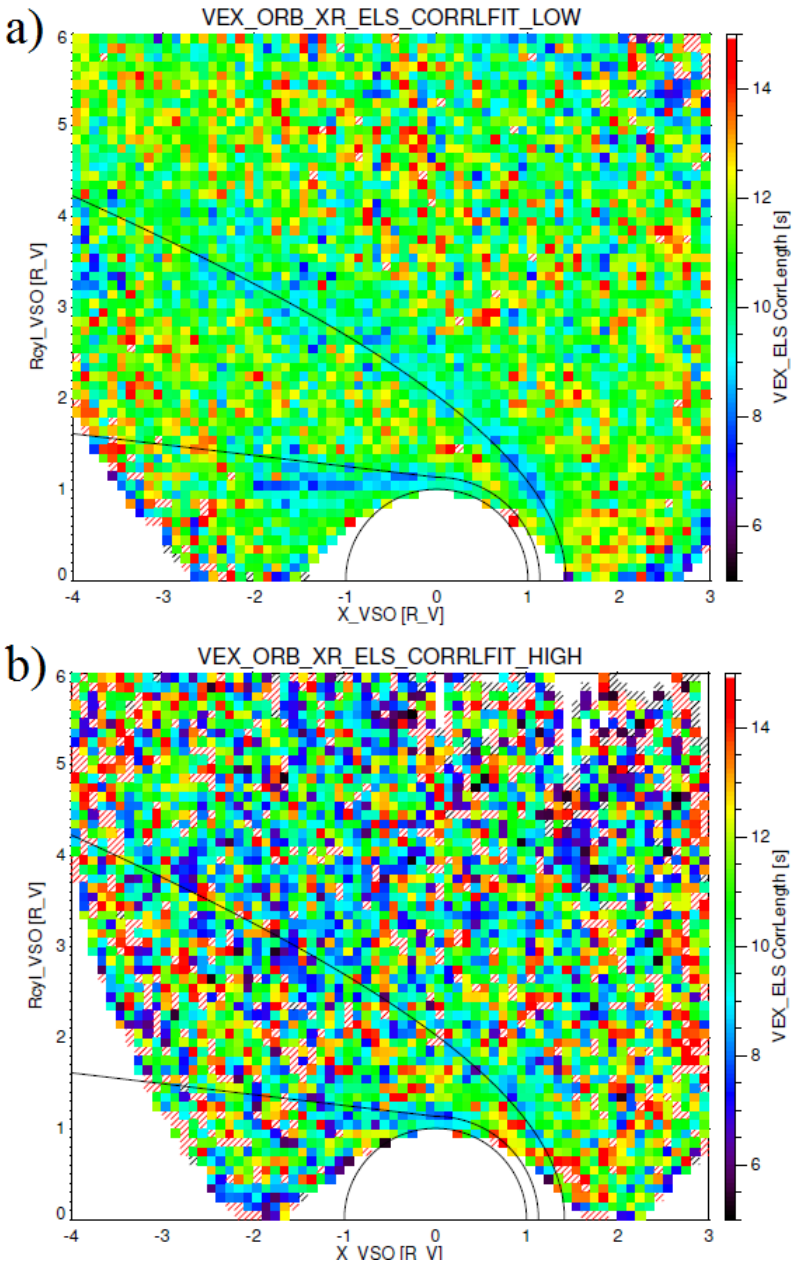
According to the same procedure used in the study on Mars, we also investigated if the CL changes with the solar wind pressure (SWP) variation around Venus. Again, the analysis was divided in periods of low (<1 nPa) and high pressure (1< SWP< 100 nPa) intervals.

4.2.1.1.1.1 Low and High Solar Wind Pressure Variation

CLs during periods of low and high solar wind pressures are shown in Figure 4.25. The map for periods of low pressure is shown in Figure 4.25-a) and for high pressure in figure 4.25-b). The plasma boundaries are also shown in both figures. In the map of low pressure (Figure 4.25-a)) it is possible to see the plasma boundaries in the CL, where low correlation lengths are observed in the bow shock (8.5 seconds). The values of the CLs show a significant variation in the solar wind, between 10 and 15 seconds, but in the subsolar point the dominant CLs vary between 12.5 and 13.5 seconds. The largest CL was observed in the MPB (14 seconds), in a small region around the nose of the planet, and also in the nightside of the magnetosheath (13-14 seconds). At the dayside of the magnetosheath, the CL varies around 12-12.5 seconds. For periods of high pressure (Figure 4.25-b)) significant values of CL can be observed in solar wind (13.5- >15 seconds) and also in the plasma boundaries and regions of the induced magnetosphere of Venus. At the bow shock CL values are about 8.5-9.5 seconds, but CL of 14 seconds can be observed in a small region. At the dayside of the magnetosheath values higher than 14 seconds were found. CLs at the MPB present high values between 14 and 15 seconds.

The difference during high and low pressure intervals observed for Mars can also be noticed here. During periods of high pressure, large CLs are observed in all regions, including in the magnetosheath. Whereas during periods of low pressure the CLs are lower in almost all regions of the Venusian magnetosphere. These results indicate that as it happens for Mars, in periods of low pressure, the intensity of ULF waves are lower than in periods of high pressure (LUNDIN et al., 2011), and reflected or heavy ions from the exosphere destroy those waves, but during periods of high pressure, ULF waves have high intensity and can penetrate into low atmospheric regions, contributing to the planetary ions escape.

Figure 4.25- Maps of correlation length during periods of low solar wind pressure (<1 nPa) a),and during periods of high solar wind pressure (1-100 nPa) b) in temporal scale (electron density).



These plots show the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.

Source: Author production

4.2.1.1.1.2 Solar cycle Variation

Besides the analysis of the CLs dependence with the solar wind pressure, the variation of CLs with the solar cycle has been studied for Venus, once that

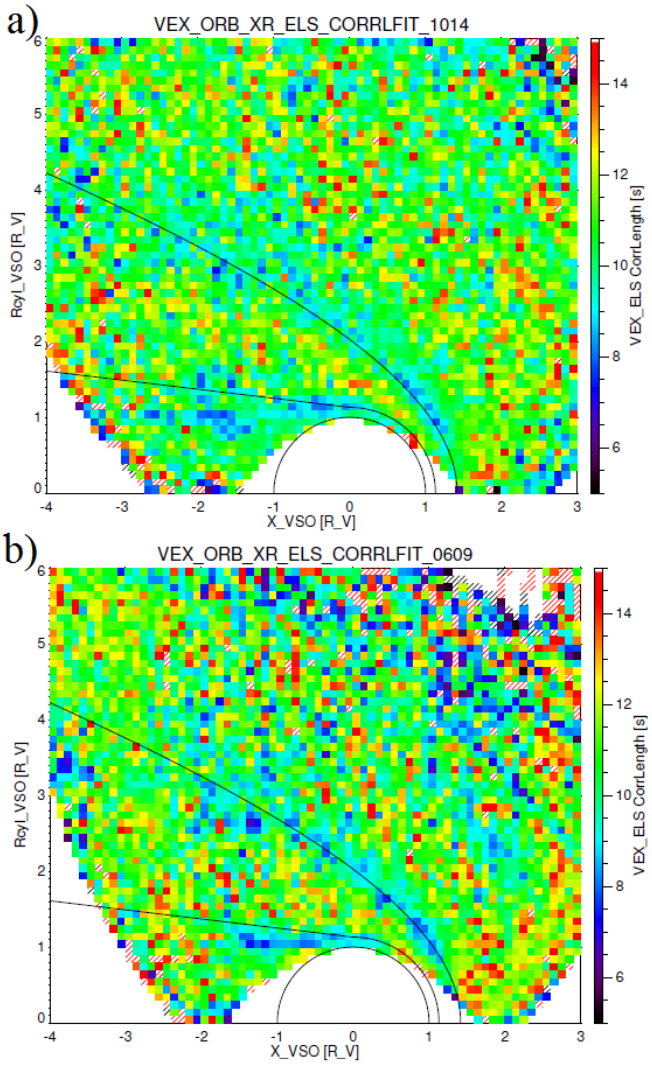
different of Mars, Venus plasma environment suffers a significant influence of the solar cycle variation, since the planet is closer to the Sun (receives more EUV radiation) and also is bigger than Mars, which means higher ionospheric density (SHAN et al., 2015).

In this analysis the data were divided in two groups, the solar cycle declining/minimum phases (2006-2009) and ascending/maximum phases (2010-2014). Figure 4.26 shows the maps for both cases, where the solar activity maximum periods are shown in the panel a) and the solar minimum activity periods in panel b). Again, in both figures the plasma boundaries are clearly seen, where low values of CL are observed. For the maximum activity periods (Figure 4.26-a)) the highest values of CL are observed in the MPB which is around 14 seconds. In the solar wind, at the foreshock region, values of about 12-13 seconds are observed. At the bow shock the dominant CL is of approximately 8-9 seconds, although values between 10.5 and 11 seconds can be observed in a small region of the boundary. At the dayside of the magnetosheath, values of the CL between 11.5 and 12.5 seconds are seen. In the nightside of that region, high values can be observed, varying between 12.5 and 14 seconds. In the magnetotail, values between 12 and 13 seconds are dominant.

During periods of minimum solar activity (Figure 26.b)) CL values are lower in the boundaries and at the dayside of the magnetosheath comparing with periods of high solar activity. Although the boundaries can be observed in the figure, the values of CL are lower than in Figure 4.26-a). In the MPB, where high values of CL are observed, it varies between 12 and 12.5 seconds. At the bow shock, values of 8-8.5 seconds are dominant. In the solar wind, CLs are bigger than in periods of maximum solar activity, and values around 12.5 and 14 seconds are dominant at the foreshock region. CLs at the dayside of the magnetosheath are between 11-12 seconds. At the nightside, high values are observed (13.5-14.5 seconds). In the magnetotail high values are observed during periods of low activity than during periods of high solar activity, which are closer to the planet. During periods of low activity, CLs in the tail are dominant

around 13 seconds, and can reach values higher than the maximum value of the color scale, 15 seconds.

Figure 4.26- Maps of correlation length during the solar cycle activity periods: a) maximum solar activity period; b) minimum solar activity period (electron density).



These plots show the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.

Source: Author production.

Comparing the panels a) and b) from the Figure 4.26 it is possible to notice that the bow shock at the dayside of the planet is found closer to the planet in the map of CL during the low solar activity period (Figure 4.26-b)) if compared with the high solar activity period (Figure 4.26-a)). This result has been also reported

by other works (MARTINECZ et al., 2008; SHAN et al., 2015; XIAO et al., 2017) and it is due to the higher EUV fluxes when solar activity is strong, and consequentially the ionosphere of Venus extends into the magnetosheath, since more neutral particles are ionized (RUSSELL et al., 1988; EDBERG et al., 2010; SHAN et al., 2015).

Table 4.10 shows a summary with the correlation lengths in temporal scale in the main regions and boundaries of the Venus magnetosphere.

Table 4.10- Maximum values of correlation length in temporal scale in plasma boundaries and regions of the Magnetosphere of Venus.

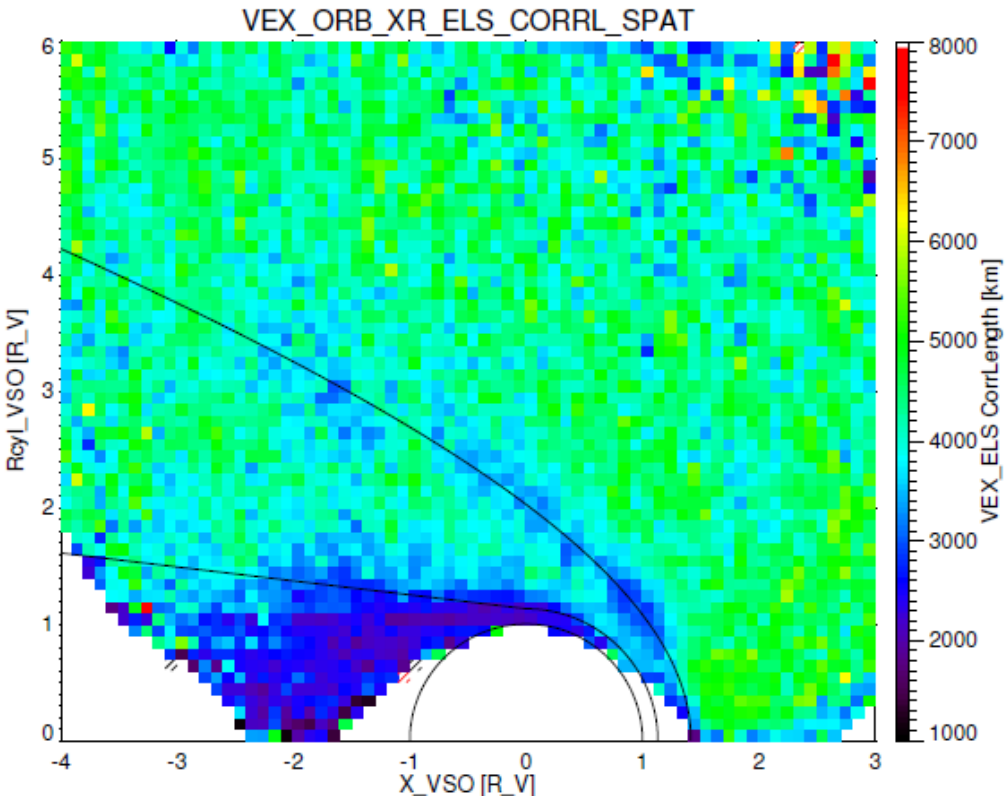
Correlation length in temporal scale (Seconds)					
Regions	Solar Wind	Bow Shock	Magnetosheath (dayside)	MPB	Tail
Total	12.5-13.5	9-10	11.5-12	14	14
High pressure intervals	13.5 - > 15	8.5-9	14	14-15	>15
Low pressure intervals	12.5-13.5	8.5-9.5	12-12.5	14	13.5-14.5
Solar Maximum period	12-13	8-9	11.5-12.5	14	12-13
Solar Minimum period	12.5-14	8-8.5	11-12	12.5	13-15

4.2.1.1.2 Spatial Scale

The analysis of CLs in spatial scale is shown in the map of Figure 4.27. The CL is represented by color scales, which vary between $1x10^3$ and $8x10^3$ km. In the

spatial scale, the CL of the electron density data also presented lower values at the boundaries of the Venusian magnetosphere (bow shock, MPB) presented in Figure 4.24 (temporal scale). The dominant value of CL at the bow shock is of $3.2x10^3$ km, and in the MPB is around $2.8x10^3$ km, but in the dayside both boundaries show CL values larger than the dominant values at the boundaries, of about $4x10^3$ and $4.1x10^3$ km, respectively. At the dayside magnetosheath, CLs of $4x10^3$ km can be seen, while in the nightside, they are larger, showing values of $5x10^3$ km, about the same values of CLs in the solar wind. In the magnetotail, low values of CLs are observed ($2.8x10^3$ km) for the most part of it, but in the flanks, CLs can reach $4.3x10^3$ km.

Figure 4.27- Maps of correlation length around Venus in spatial scale (2006-2014) (electron density).



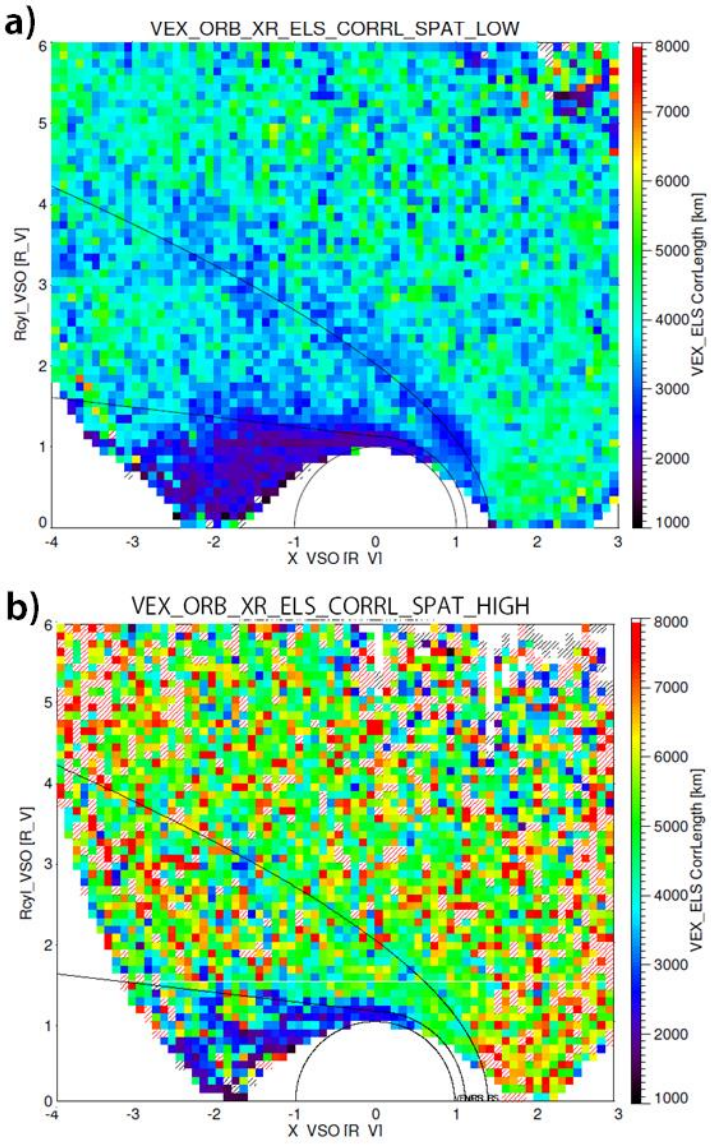
This figure shows the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.

Source: Author production.

4.2.1.1.2.1 Correlation length for Intervals with High and Low Pressures Variation

The solar wind pressure variation analysis has also been done for spatial scale for Venus, which is presented in Figure 4.28.

Figure 4.28- Maps of correlation length during the a) low solar wind pressure periods (< 1nPa) and b) high solar wind pressure periods (1-100 nPa) (electron density).



These plots show the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.

Source: Author production.

Figure 4.28-a) shows the CL for low pressure periods. In the solar wind, the CL is around $5X10^3k$m. In the magnetotail the CL is small, and mainly varies between $2X10^3$-$2.5X10^3$ km. In the flanks, large CLs can be observed ($4X10^3$ km). At the plasma boundaries, bow shock and MPB, the CL has values around $3X10^3$-$3.6X10^3$ km and $4X10^3 - 4.2X10^3k$m, respectively. In the dayside of the magnetosheath, values around $3.4X10^3$km were found, while in the nightside it can reach values between $4X10^3 - 5X10^3k$m.

In the map for high pressure (Figure 4.28-b)) large values are observed in the solar wind ($6.8X10^3$-$8X10^3$km) as in all other regions. At the bow shock the dominant CL is $4X10^3$ -$5X10^3$ km, but values larger than the maximum value of the color bar scale ($8X10^3$ km) are observed in a small region at the dayside. MPB shows CLs near $5.6X10^3$ km. At the dayside magnetosheath the CL shows values of about $5.3X10^3$ km and varies between $6X10^3$-$1.2X10^4$km in the nightside. The magnetotail presents the dominant CLs varying between $2.6X10^3$ and $3X10^3$km, but CLs of $5 - 7X10^3$km can be observed in some regions of the tail. The analysis of the variation of the CL with solar wind pressure, for spatial scale, shows the same result observed for temporal scale. Figure 4.28 shows the results for high pressure periods where we observe high values dominating all regions.

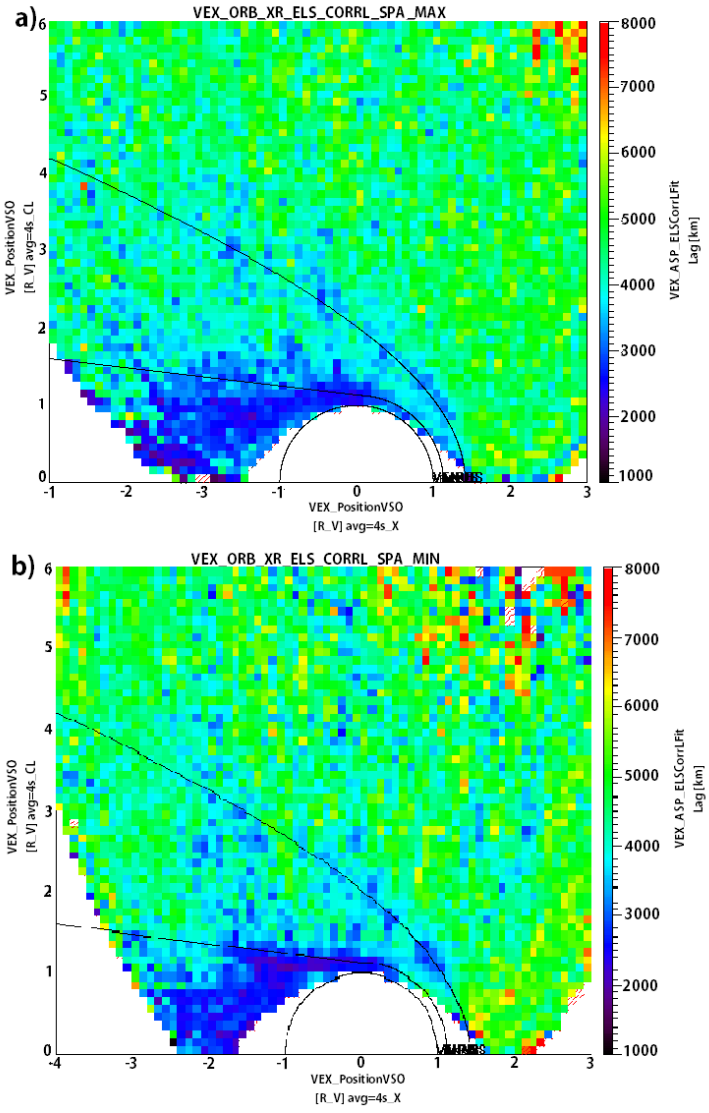
Figure 4.28-a) shows the results for low pressure periods where we observe lower values in the night side of the magnetosheath and magnetotail. The possible explanation has been discussed in the temporal analysis where we consider that the reflected ions or heavy ion exosphere has significant effect in the wave trains in periods of low solar wind pressure.

In Venus, the difference between high and low solar wind pressure intervals, is more expressive then in the results for MEX analysis in Mars (Figure 4.16), probably due to the Venus proximity to the Sun. Further, at Venus there is more incidence of ICMEs (Interplanetary Coronal Mass Ejections) and CIRS (Corotating Interaction Region).

4.2.1.1.2.2 Correlation Length Variation with Solar Cycle

For spatial scale the variation of the CL with solar cycle has been determined in the interval 2006-2013, from 2006 to 2009 for the minimum solar activity period and from 2010 to 2013 for the maximum solar activity period. Figure 4.29 shows the results.

Figure 4.29- Maps of correlation length during periods of maximum solar activity (2010-2013) a), and during periods of minimum solar activity (2006-2009) b) in spatial scale (electron density).



These plots show the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.
Source: Author production.

Panel a) shows the CL for the high solar activity period with values between $5.4X10^3$-$6.2X10^3$ km. It can be observed in the solar wind close to the planet, which is slightly larger than the dominant CLs in all region of the solar wind near Venus ($5X10^3$-$5.5X10^3$ km). At the first plasma boundary, the bow shock, the CL varies between $3.2X10^3$-$3.8X10^3$ km. Values larger than that are observed at the MPB ($3.8X10^3 - 4.2X10^3$ km). The dominant CL at the dayside of the magnetosheath is around $3.8X10^3$ km and in the nightside large CLs are observed ($5.3X10^3$-$5.8X10^3$) km. In the magnetotail the dominant CL is $2.5X10^3$ km, but values between $3.8X10^3$-$5.6X10^3$ km are observed in the flanks.

For low solar activity periods the CLs in the solar wind in the vicinity of Venus are in the range $3.5X10^3$-$4X10^3$ km, but in the subsolar region it varies from $5.4X10^3$ km to $7.2X10^3$ km (Figure 4.29-b)). At the bow shock the dominant CL varies between $3.2X10^3$-$5X10^3$ km. CLs larger than $3.7X10^3$ km can be observed at the MPB. At the dayside magnetosheath, CLs of $4X10^3$-$4.2X10^3$ km are observed. In the nightside, CLs are larger than at the dayside, $4X10^3$-$5X10^3$ km. The same dominant CL value observed during maximum activity is observed here, but large CLs are noted in some regions ($4.8X10^3$-$6.7X10^3$ km).

In a work analyzing the variation of the CL close to Earth with the solar cycle, Wicks et al. (2010) used 35 years of velocity and magnetic field data. Those authors observed that the CL of the magnetic field is larger during the solar maximum period than during solar minimum period, and that the difference between those intervals increases by a factor of two. During the solar minimum the CL values were found as $0.75X10^6$ km and during solar maximum $1.75X10^6$ km. In our analysis the dominant value found for correlation length in the solar wind during the maximum period was $5.5X10^3$ km and during minimum period was $4X10^3$ km, indicating an increase of 1.38, approximately. That difference observed here is caused due to the dependence of the CL with the window size used in the data analysis. Here, with the window size used let us have a maximum CL in an order of 10^4km. The size of window used, in this study was chose due to the interest in correlation scales comparable to MPB and magnetosheath cross section. To investigate pure solar wind, larger window

sizes and more continuous datasets would be needed. The Wicks et al. (2010) study was certainly done using larger window size in the analysis and further, ACE (spacecraft used in their analysis) data are more continuous.

As it was done for temporal analysis, a table (Table 4.11) with CLs at the main plasma boundaries and regions of the Venus magnetosphere are shown here.

Table 4.11- Maximum correlation length values in spatial scale in the plasma boundaries and regions of the Magnetosphere of Venus.

Correlation Length (km)					
Region	**Solar Wind**	**Bow shock**	**Magnetosheath (dayside)**	**MPB (dayside)**	**Tail**
Total (all periods)	$5x10^3$	$4x10^3$	$4x10^3$	$4.1x10^3$	$4.3x10^3$
High pressure (1-100 nPa)	$6.8X10^3$-$>8X10^3$	$4X10^3$-$5X10^3$	$5.3X10^3$	$5.6X10^3$	$5X10^3-7X10^3$
Low pressure (<1nPa)	$5X10^3$	$3X10^3$-$3.6X10^3$	$3.4X10^3$	$4X10^3$-$4.2X10^3$	$4X10^3$
Ratio $(\frac{HSWP\ CL}{LSWP\ CL})$	1.5	1.4	1.6	1.4	1.5
Maximum Solar	$5.4X10^3$-$6.2X10^3$	$3.2X10^3$-$3.8X10^3$	$3.8X10^3$	$3.8X10^3$-$4.2X10^3$	$3.8X10^3$-$5.6X10^3$
Minimum Solar	$5.4X10^3$-$7.2X10^3$	$3.2X10^3$-$5X10^3$	$4X10^3$-$4.2X10^3$	$3.7X10^3$-$4.2X10^3$	$4.8X10^3$-$6.7X10^3$

The comparison of the CL and the mean size of the magnetosheath and MPB are presented in table 4.12, where the size of the plasma boundaries/regions (obtained from Martinecz et al. (2008)), the CL and the ratio between them are presented.

Table 4.12- Correlation length normalized by the size of the plasma boundaries and regions of the magnetosphere of Venus.

Boundaries/Regions	Size (km)	Correlation length (km)	Correlation length/Size
Magnetosheath	$2.33X10^3$	$4x10^3$	1.7
MPB	$2.27X10^2$	$4.1x10^3$	18.1

From Table 4.12 it is possible to observe that CLs in the magnetosheath are at least 1.7 times larger than the size of that plasma region, which means that discontinuities observed at the magnetosheath extend to large distances from there. For the MPB the CL is 18.1 times bigger than the boundary sizes, which indicates that fluctuations at this boundary can be correlated with fluctuations in the ionosphere, and may indicate that ULF waves can propagate into the ionopause of the planet. Since, as it was explained for Mars CL analysis, large CLs mean that fluctuations are correlated at large distances, being able to be correlated with oscillations in the ionosphere, probably due to resonant effect that those wave trains cause at the ionopause of the planet.

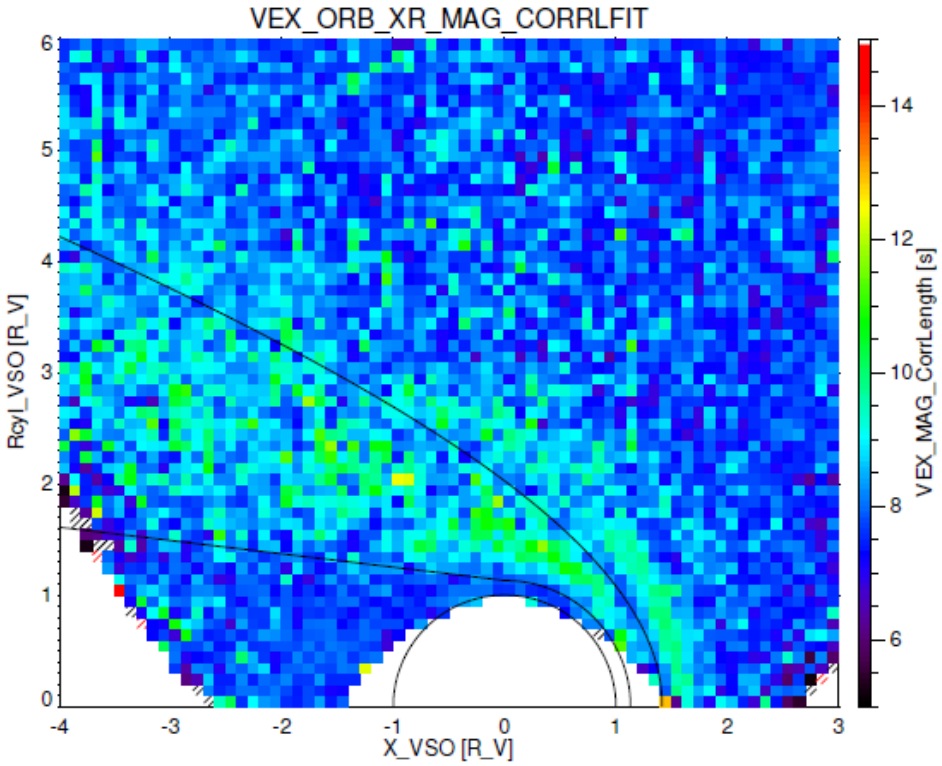
4.2.1.2 Magnetic Field

The analysis of the CLs was also performed for the magnetic field data divided in temporal and spatial analysis. The results for both analyses are presented below.

4.2.1.2.1 Temporal Analysis

In figure 4.30 the temporal analysis of the CL in the magnetic field around Venus is presented. The CLs here are also presented in color scale varying between 5-15 seconds. In this figure it is clearly observed that CLs are higher in the solar wind near the planet and also in the magnetosheath, mainly in the nightside region. In the solar wind values around 9.5-10 seconds are seen, and in the dayside and nightside magnetosheath, CLs show values of 9-9.5 seconds and 10.5-11 seconds, respectively. The bow shock is also observed in the figure as a boundary dominated by small CLs (7.5-8.5 seconds). The MPB presents similar values of the bow shock in most part of the boundary, although CLs of 10 seconds can be observed in a small region at the nose of the planet. In the magnetotail small CLs are predominant, which show values around 8 seconds. Besides that, CLs between 9.5 and 10 seconds can be observed in a small region in the central region of the tail.

Figure 4.30- Maps of correlation length around Venus in temporal scale for all VEX magnetic field data.



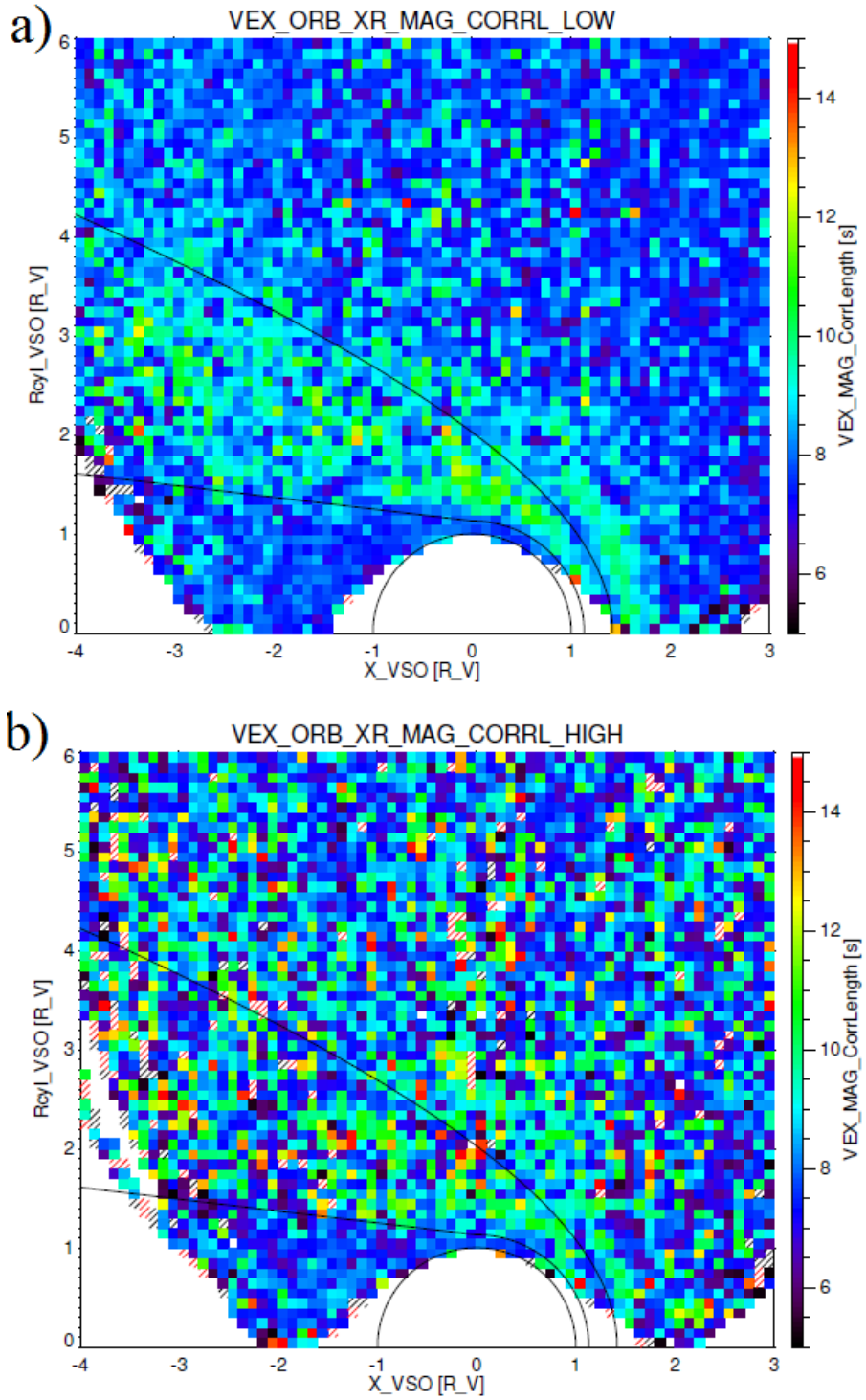
This figure shows the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.
Source: Author production.

Comparing the map of CL around Venus in the magnetic field with the map of CL in the electron density data in temporal scale (Figure 4.24) it is possible to observed that temporal CLs are higher in electron density than in magnetic field. The same result was observed for Mars, and the explanation for it was probably related to instrumental measurements and the presence of more rotational Alfven waves in the solar wind plasma than in the magnetic field.

4.2.1.2.1.1 Correlation length with High and Low Pressure Variation

The CLs in the magnetic field were also analyzed in function of the solar wind pressure. The results are presented in the maps of Figure 4. 31, which are similar to the result obtained from this analysis in electron density data (Figure 4.25).

Figure 4.31- Maps of correlation length during periods of low solar wind pressure (<1 nPa) a), and during periods of high solar wind pressure (1-100 nPa) b) in temporal scale (magnetic field).



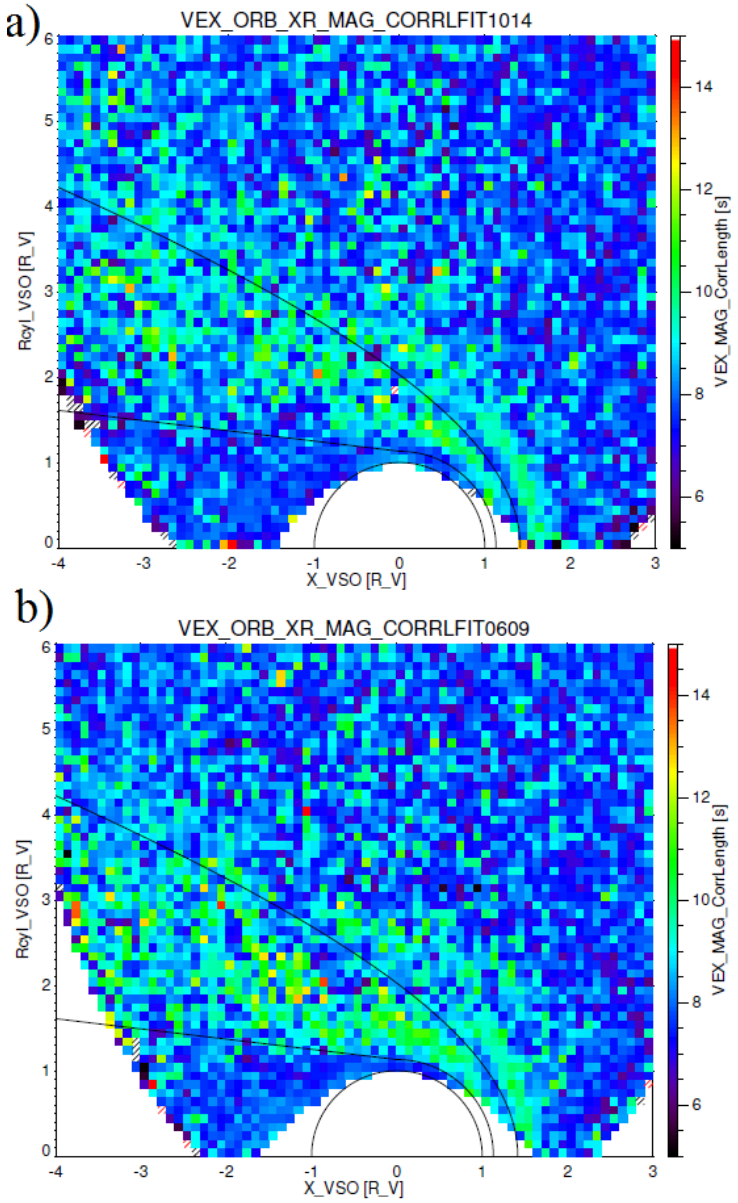
These plots show the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.
Source: Author production.

CL during periods of low pressure (Figure 4.31-a)) presents high values in the magnetosheath and solar wind, as it is observed in the analysis for the whole VEX interval. In the solar wind CL is about 9-10 seconds and in the magnetosheath it is approximately 10 seconds at the dayside and varies between 11.5 and 12.5 seconds at the nightside. At the plasma boundaries, the CL is also observed with low values, from 8 to 8.5 seconds, but CL of 14 seconds can be observed in a small bin at the MPB dayside. In the magnetotail the dominant CL value is around 8 seconds, but CL of 9-10 seconds and higher than 15 seconds can be observed at the flanks. During periods of high pressure (Figure 4.31-b)) CL is higher in all magnetospheric regions, showing values between 12 and 14 seconds in the solar wind and at the dayside magnetosheath, and from 12 to higher than 15 seconds in the night side region. The dayside of the MPB is dominated by CLs of 10.5-11.5 seconds and the bow shock by CLs of 8 to 9.5 seconds. In the tail it is about 8-9 seconds, but values around 12-14.5 seconds can be observed in the middle of the tail and at the flanks, with CLs of more the 15 seconds still been observed.

4.2.1.2.1.2 Correlation Length Variation with Solar Cycle

The analysis of the solar cycle variation of the correlation lengths in the magnetic field data around Venus is shown in Figure 4.32. In Figure 4.32-a) the map of CL during periods of maximum solar activity is presented, where it is possible to notice the plasma boundaries, bow shock and MPB, that present low values of CLs of 8-8.5 and 9 to 9.5 seconds, respectively. At the dayside of the magnetosheath, CLs from 9.5 to 10.5 seconds are observed, which are close to the values observed in the solar wind (10-11 seconds). At the nightside of the region, the CL is around 10-13 seconds. The magnetotail shows dominant CL of 8 to 8.5 seconds, but it can varies between 9.5 and 12 seconds in some regions of the tail. The flank high values can being seen, reaching values higher than 15 seconds.

Figure 4.32- Maps of correlation length during periods of solar maximum activity (2010-2013) a), and during periods of solar minimum activity (2006-2009) b) in temporal scale (magnetic field).



These show the number of sample per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.
Source: Author production.

The map of CL during solar minimum activity is shown in Figure 4.32-b), where CLs seem to be lower or equal in all boundary/regions of the magnetosheath (except for the bow shock where CL values observed of 8-9 seconds, are slightly higher) if compared with periods of maximum activity. The solar wind

(9.5-10.5 seconds) and the dayside magnetosheath (9.5-10 seconds) still show similar CLs. At the nightside of the magnetosheath the same values of CLs during solar maximum activity are observed here (10-13 seconds). CLs of 8-8.5 seconds dominate the magnetotail. At the flank it can be 13 seconds or even higher than 15 seconds, but there is a minor number of bins than during periods of maximum solar activity.

From these Figures (Figure 4.32-a) and Figure 4.32-b)), the motion of the bow shock away to the planet during periods of maximum solar activity can be observed in the magnetic field CL analysis, as it was seen in the electron density analysis. Again, what causes this motion is the higher incidence of solar EUV flux, which consequently increases the number of planetary ion production.

The CLs in the magnetic field data in temporal scale are summarized in table 4.13 for each region of the magnetosphere of Venus. It is important to mention that the values of the tables represent the maximum CL observed in each plasma boundary or region.

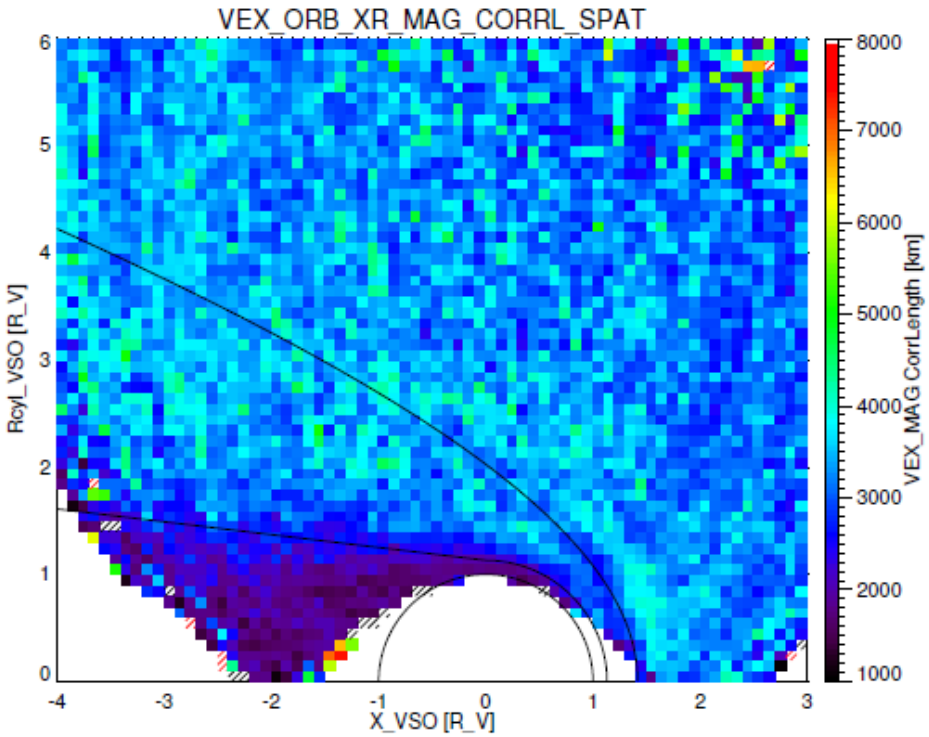
Table 4.13 shows the correlation lengths (magnetic field) in temporal scale for each region of the magnetosphere of Venus.

Correlation length in temporal scale (Seconds)					
Regions	Solar Wind	Bow Shock	Magnetosheath (dayside)	MPB (dayside)	Tail
Total	9.5-10	7.5-8.5	9-9.5	10	8
High pressure intervals	9-10	8-8.5	10	14	9-10
Low pressure intervals	12-14	8-9.5	12-14	10.5-11.5	12-14.5
Solar maximum period	10-11	8-8.5	9.5-10.5	9-9.5	9.5-12
Solar Minimum period	9.5-10.5	8-9	9.5-10	8.5-10	8-8.5

4.2.1.2.2 Spatial Scale

After multiplying the temporal CL by the solar wind velocity, the CL in the magnetic field in spatial scale was obtained. The map of magnetic field CLs around Venus during the whole VEX mission is presented in the Figure 4.33. It is possible to observe that CLs are larger in the solar wind ($4x10^3$ km) and at night side of the magnetosheath ($4x10^3$- $4.8x10^3$ km). At the dayside magnetosheath it shows scales of $3.5x10^3$ km. CLs smaller than $2x10^3$ km can be observed in the magnetotail. In some regions it varies between $2.8x10^3$ and $3.3x10^3$ km, but close to the planet, CLs from $5.5x10^3$ to $7x10^3$ km are seen. The plasma boundaries also present smaller CLs in spatial analysis, where at the MPB it is around $2.8x10^3$ km and at the bow shock it varies between $2.8x10^3$- $3x10^3$ km.

Figure 4.33- Maps of correlation length around Venus in spatial scale (2006-2014) (magnetic field).

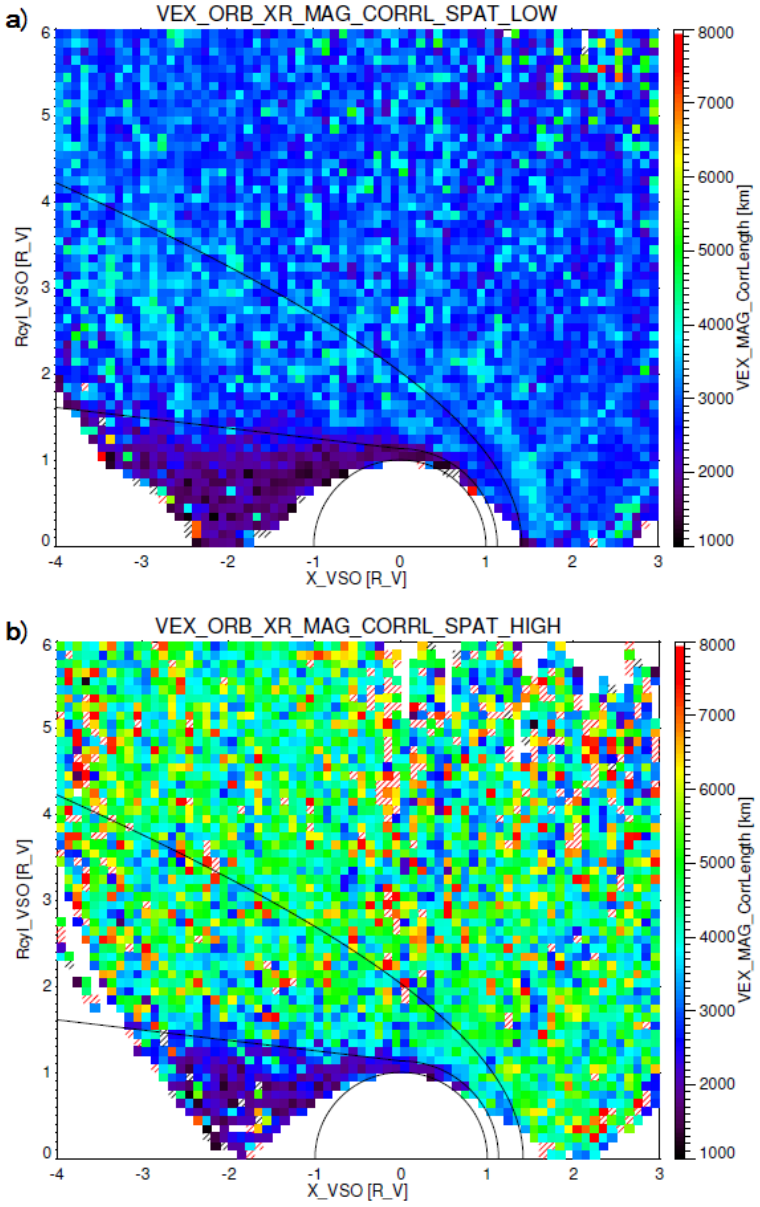


This figure shows the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.
Source: Author production.

4.2.1.2.2.1 Correlation length with High and Low Pressure Variation

Figure 4.34 shows magnetic field CL in spatial scale during periods of low (4.34-a)) and high (4.34-b)) solar wind pressure.

Figure 4.34- Maps of correlation length during periods of low solar wind pressure (<1 nPa) a), and during periods of high solar wind pressure (1-100 nPa) b) in spatial scale (magnetic field).



These plots show the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.
Source: Author production.

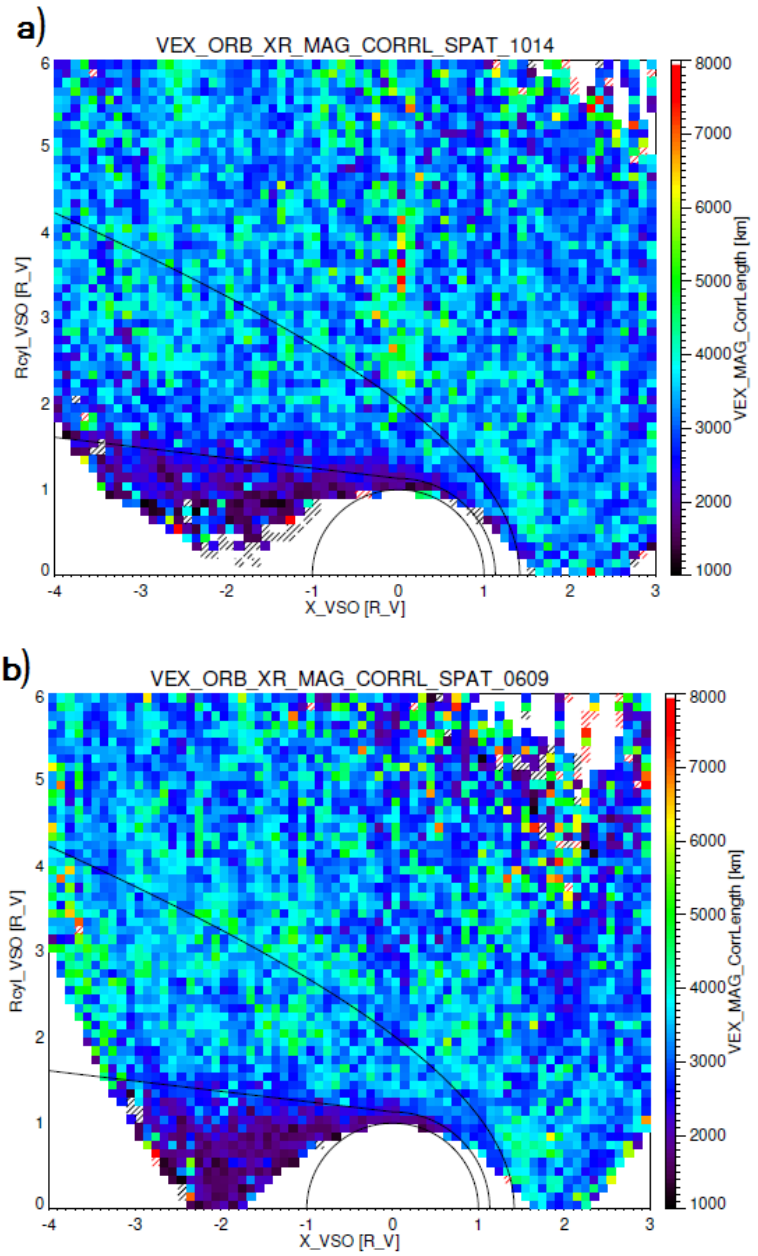
For low solar wind pressure periods (Figure 4.34-a)) CLs in the solar wind vary between $3.8x10^3$ and $4x10^3$ km. At the dayside of the plasma boundaries, bow shock and MPB, it varies between $2.7x10^3$-$3x10^3$ km and between $2.4x10^3$-$3.1x10^3$ km, respectively. The dayside magnetosheath values of CL are of $2.8x10^3$ -$3x10^3$ km, while in the nightside, CL varies between $4x10^3$ and $4.6x10^3$ km. The magnetotail is dominated by CLs of $1.3x10^3$-$2.1x10^3$ km. In periods of high solar wind pressure (Figure 4.34-b)), CLs are larger than during low solar wind activity intervals in all regions. In the subsolar point, the CL in the solar wind is about $5x10^3$-$6x10^3$ km. At the bow shock it varies between $4x10^3$ km and $4.8x10^3$ km. At the dayside of the magnetosheath, the CL reaches values between $3.8x10^3$ km and $4.5x10^3$ km. At the MPB, CLs of of $2.8x10^3$-$3.8x10^3$ km can be seen. In the magnetotail, where CLs between $4x10^3$-$5.5x10^3$ km are dominant, CLs varying between $7.5x10^3$-$8x10^3$ km can be observed in small regions.

4.2.1.2.2.2 Correlation Length Variation with Solar Cycle

The solar cycle variation of the CLs in the magnetic field is presented in Figures 4.35-a) and 4.35-b). At the subsolar point, CLs in the solar wind show values of $4x10^3$-$4.5x10^3$ km during periods of maximum solar activity (Figure 4.35-a)). For the same interval, CLs in the bow shock vary between $3x10^3$ km and $3.5x10^3$ km. The dayside magnetosheath shows CLs of $3.3x10^3$-$3.8x10^3$ km. In the nighside of the region, CLs of $4x10^3$ and $5x10^3$ km are frequently observed. At the MPB, similar values of CLs observed at the bow shock can be seen here ($3x10^3$-$3.2x10^3$ km). The magnetotail is dominated by low values of CLs ($1.5x10^3$-$2.2x10^3$km), except for a small region in the middle of the tail, where it can reach values between $3.4x10^3$ and $4x10^3$km.

Looking at both figures (4.35-a) and 4.35-b)), it is clear that the motion of the bow shock far away from the planet during periods of maximum solar activity is also observed here, which are caused due to the more intense EUV flux during solar maximum activity intervals, as it was discussed in section 4.2.1.1.1.

Figure 4.35- Maps of correlation length during periods of solar maximum activity (2010-2013) a), and during periods of solar minimum activity (2006-2009) b) in spatial scale (magnetic field).



These plots show the number of samples per spatial bin in cylindrical coordinates in the VSO frame. R_{CL} is the coordinate perpendicular to the Mars-Sun axis. Mean bow shock and MPB position after Martinecz et al. (2009) are also plotted.
Source: Author production.

As it was observed in temporal analysis (Figure 4.32), during solar minimum activity (Figure 4.35-b)), CLs in the magnetic field in spatial scale are similar to the values obtained during solar maximum activity, which shows values equal or

smaller than they were observed in Figure 4.35-a), except for the plasma boundaries, where CLs were slightly larger ($3x10^3$-$4x10^3$km at the bow shock and $3x10^3$-$3.5x10^3$ km at the MPB). In solar wind, CLs are observed varying between $4x10^3$-$4.3x10^3$ km. At the dayside magnetosheath it is about $3x10^3$-$3.7x10^3$ km, in the nightside the same values observed during solar maximum activity are seen. The lowest values of CL in this analysis are observed in the magnetotail, where it is approximately $1.5x10^3$ km in almost the entire region.

For better viewing of the CL in each region, again, a table (Table 4.14) with the dominant CL (spatial scale) in the magnetic field for each region of the Venusian magnetosphere was done.

Table 4.14 Shows the maximum value of correlation lengths (magnetic field) in spatial scale for each region of the magnetosphere of Venus.

Correlation Length (km)					
Region	Solar Wind	Bow shock	Magnetosheath (dayside)	MPB (dayside)	Tail
Total (all periods)	$4x10^3$	$2.8x10^3$-$3x10^3$	$3.5x10^3$	$2.8x10^3$	$2.8x10^3$ - $3.3x10^3$
High pressure (1-100 nPa) intervals	$5x10^3$-$6x10^3$	$4x10^3$-$4.8x10^3$	$3.8x10^3$-$4.5x10^3$	$2.8x10^3$-$3.8x10^3$	$1.5x10^3$-$2.4x10^3$
Low pressure (<1nPa) intervals	$3.8x10^3$-$4x10^3$	$2.7x10^3$-$3x10^3$	$2.8x10^3$-$3.2x10^3$	$2.4x10^3$-$3.1x10^3$	$1.3x10^3$-$2.1x10^3$
Ratio $(\frac{HSWP\ CL}{LSWP\ CL})$	1.4	1.5	1.4	1.2	1.1
Solar Maximum period	$4x10^3$ – $4.5x10^3$	$3x10^3$-$3.5x10^3$	$3.3x10^3$-$3.8x10^3$	$3x10^3$-$3.2x10^3$	$3.4x10^3$-$4x10^3$
Solar Minimum period	$4x10^3$ – $4.3x10^3$	$3x10^3$-$4x10^3$	$3x10^3$-$3.7x10^3$	$3x10^3$-$3.5x10^3$	$1.5x10^3$-$3x10^3$

The magnetic field's CL was also normalized by the sizes of the plasma boundaries/regions, and the values obtained for this normalization are shown in Table 4.15.

Table 4.15- Magnetic field's correlation length normalized by the size of the plasma boundaries and regions of the magnetosphere of Venus.

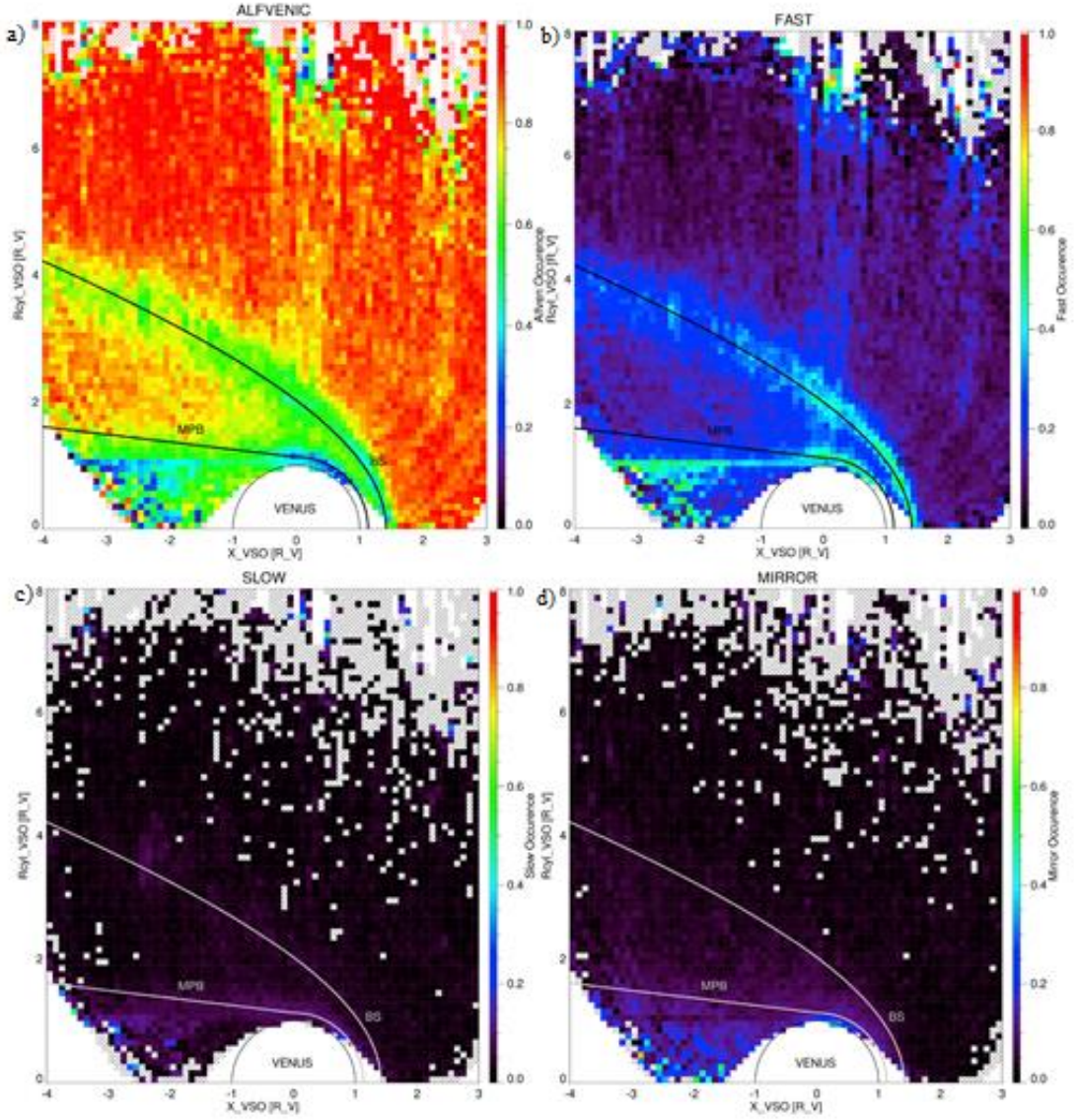
Boundaries/Regions	Size (km)	Correlation length (km)	Correlation length/Size
Magnetosheath	$2.33X10^3$	$3.5x10^3$	1.5
MPB	$2.27X10^2$	$2.8x10^3$	12.3

Although magnetic field's CLs normalized by the magnetospheric boundary/region are smaller than the normalized electron density's CLs, same conclusions are obtained, waves present at the dayside magnetosheath can be correlated with fluctuations in the ionosphere, since they still larger than magnetosheath and MPB, 1.5 and 12.3 times, respectively. These values are similar the values found in the electron density analysis, 1.7 times for magnetosheath and 18.1 times for the MPB.

4.2.2 Wave Modes

The statistical occurrence rate of a specific wave type has been investigated using data from VEX magnetometer and VEX/ASPERA-4/ELS electron spectrometer, both down sampled with a temporal resolution of 4s in a 128s sliding window across the same interval of data used in the analysis of CL (part of these results we have published in FRAENZ et al., 2017). The result of that analysis is shown in Figure 4.36, where it is possible to note the statistical probability to observe a certain wave type in this spatial bin. Wave type identification is always performed for the frequency of maximum power. Maximum power is usually contained in the lowest frequency (8 mHz) of the frequency window 8–125 mHz.

Figure 4.36 VEX MAG/ELS wave classification May 2006-Nov 2014.



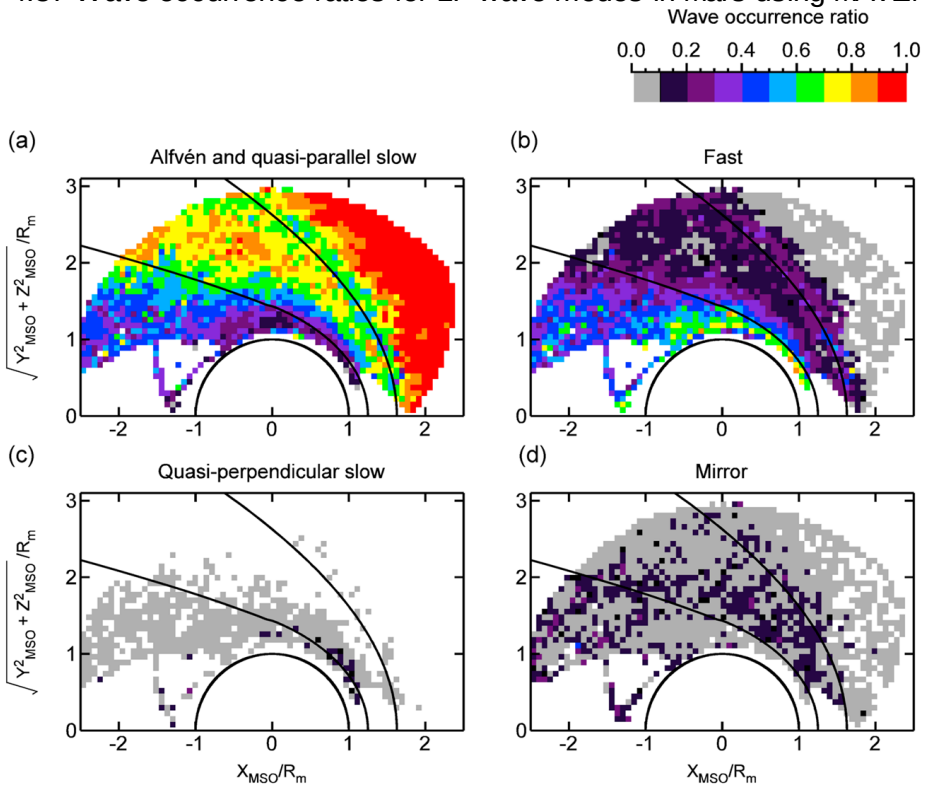
Color shows the fraction of observations identified as a specific wave mode in a spatial bin of cylindrical coordinates in the VSO frame. From top left to bottom right: Alfvenic, Fast mode, Slow mode and Mirror mode.
Source: Fraenz et al. (2017).

The color scale in the figure shows the fraction of observations identified as a specific wave type in a spatial bin of cylindrical coordinates in the VSO frame. The results for each wave mode are shown in: Figure 4.36-a) Alfvenic mode, 4.36-b) fast mode, 4.36-c) slow mode and 4.36-d) mirror mode. In Figure 4.36-a) it is possible to observe that Alfvenic waves are dominating everywhere, mostly inside of the magnetosheath and in the upstream solar wind (>80%).

Fast mode waves are observed around the bow shock and dayside of the MPB (Figure 4.36-b)) with a probability of up to 40%. Slow modes also can be observed in the bow shock and the MPB, but with a small probability (less than 10%), as Figure 4.36-c) shows. Mirror mode waves are observed throughout the magnetosheath with probabilities between 10 and 20%, increasing towards the magnetic barrier.

Figure 4.37 shows the wave occurrence ratios for each wave mode in the Martian magnetosphere developed by Ruhunusiri et al. (2015a) using data from over 700 MAVEN orbits (less than an year). In Figure 4.37-a) Alfven and quasi-parallel slow are shown, 4.37-b) Fast mode, 4.37-c) Quasi-perpendicular slow mode and 4.37-d) Mirror mode.

Figure 4.37 Wave occurrence ratios for LF wave modes in Mars using MAVEN data.



Source: Ruhunusiri et al. (2015a).

From Figure 4.36 and Figure 4.37 one can notice that these results are comparable. Alfvenic and fast mode waves show a very similar general probability distribution. The presence of slow mode waves at the bow shock and

MPB is confirmed. The higher occurrence of fast waves close to the MPB may indicate that wave energy can be transferred by compressional waves across this boundary into the upper ionosphere (see also our interpretation in Fraenz et al. (2017)).

5 CONCLUSIONS

This thesis had as its main objective the study of plasma waves around the induced magnetospheres of Mars and Venus. For Mars, this study was conducted using wavelet (for the identification of the main frequencies in the magnetosheath) and correlation length analyses. Wave penetration into the Martian ionopause was also investigated. For Venus, the correlation lengths around the planet were also identified, along with the dominant wave mode in each region of the Venusian magnetosphere. The main results of this work are presented below:

- The Martian plasma boundaries catalog was updated in this thesis, and plasma boundaries from 2014 to 2016 are now available for new researches, by contact with MPS plasma group (www.mps.mpg.de/planetary-science/ppe).
- The main frequencies of plasma waves in the magnetosheath of Mars were identified for electron density and temperature from ELS/ASPERA-3/MEX data. Electron density and electron temperature presented the most energetic periods in the range between 5-20 mHz. In the electron density spectra, 63.6% of a total of 22912 energetic frequencies showed frequencies between 5-20 mHz, while for electron temperature spectra, 61.9% of those 23395 frequencies identified were in that frequency range. Those frequencies are near the local oxygen gyrofrequency in the Mars magnetosheath. It is expected that ULF wave power is correlated with the O^+ outflow. The major source of the oscillations studied here is probably due to the bow shock where the ions are reflected at the boundary.
- No clear influence of the solar cycle on the dominant frequencies of ULF waves in the Mars magnetosheath was observed here. That absence of solar cycle effect in the frequencies may be due to the fact that although mass loading plays an important role in the magnetosphere of Mars (due

to the extent of the Martian exosphere), the magnetosphere of Mars is not very sensitive to the variable mass loading from solar EUV (which increases with the solar activity). An idea for a future work is to study the influence of the Mars orbit under these frequencies, since the distance from the Sun probably affects them. In Venus, closer to the Sun, which has a denser atmosphere and is bigger than Mars, the solar cycle probably affects these energetic frequencies, so it is also an interesting future work to be developed.

- For correlation length analyses in electron density data from MEX it was seen that:
    - In temporal scale the correlation length in the plasma boundaries and regions of the Martian magnetosphere varies between 13 and 17 seconds. The solar wind pressure shows a significant influence in the correlation length values, which are higher during periods of high solar wind pressure. In spatial scale the dominant correlation length is around $5.5x10^3$km, which can be observed in the solar wind, in the whole magnetosheath and part of the tail. Large correlation lengths were observed at the nose of the planet; those values could be seen through the magnetosheath until the inner magnetosphere. It indicates that waves at the magnetosheath can be related to oscillations in the ionosphere. This means that, in a local region, wave trains can cause resonance effects at the planetary ionopause, which consequently may contribute to an enhanced ion escape from the atmosphere of Mars.
    - Correlation length at the dayside of the Martian magnetosheath is approximately five times larger than the magnetosheath size, whereas correlation length at the MPB/MPR is 25 times larger than that region. This can be considered another indication that wave fluctuations at the magnetosheath and MPR are correlated with oscillations at the ionosphere, due to ULF waves that can penetrate into the ionopause.

- The temporal correlation length analysis using MAVEN data showed similar values as those obtained for the MEX analysis (11 to 16 seconds) for electron density data. In spatial scale the correlation length is of the same order as for MEX results. A correlation length of $4.5x10^3$ km is observed at the dayside of the magnetosheath, with lower values observed in the inner magnetosphere ($2x10^3 - 3x10^3$ km). In the magnetic field data correlation lengths (8-15 seconds in temporal scale and from $1x10^3$ to $5x10^3$ km in spatial scale) are slightly lower than in electron density data, probably due to the fact that there are more rotational Alfven waves in the plasma which are not visible in the total magnetic field value.
- 29 potential cases of wave penetration into the ionosphere of Mars have been identified in this thesis. It was seen that apparently the wave penetration depends on the solar cycle, and it occurs more frequently during periods of maximum solar activity. This is probably caused due to the extended exosphere during solar maximum, which may weaken the effect of ionopause currents, and also the energy present in extreme events that can intensify the wave power. These cases will be better investigated in a future work, where the wavelet and the kurtosis techniques will be employed on them.
- Similar results of correlation length analysis for Mars were obtained for Venus:
    - In electron density data correlation lengths around Venus vary from 9 to 14 seconds in temporal scale and from $2.8X10^3$ to $5X10^3$ km in spatial scale. Correlation length in magnetic field data around Venus is also smaller than in electron density data, which varies between 7.5-11 seconds in temporal scale and between $1.7x10^3$-$4X10^3$km in spatial scale.
    - The sizes of the magnetosheath and MPB are smaller than the correlation lengths found in these regions. Correlation lengths from electron density and magnetic field are about 1.7 times and

1.5 times larger than the magnetosheath size, respectively. In the MPB, CL is 18.1 times bigger than the boundary size for electron density and 12.3 for magnetic field's correlation length analysis. This indicates a correlation of waves in upper regions of the magnetosphere with fluctuations in the ionosphere.

- The same difference in correlation length in the analysis of their variation as a function of the solar wind pressure observed in Mars analysis was observed here. During periods of low pressure the intensity of ULF waves is weaker than in periods of high pressure. Thus it seems that reflected ions or the heavy ion exosphere may destroy those waves. On the other hand, during periods of high pressure, ULF waves have high intensity and can penetrate into low atmospheric regions, contributing to the planetary ion escape.
- The solar cycle also affects correlation lengths around Venus. During periods of minimum solar activity correlation length values are lower in the boundaries and some regions of the magnetosphere than during periods of high solar activity. During low activity, the dayside bow shock is observed closer to the planet in the correlation length (for both analyses, in electron density and magnetic field). This occurs due to the higher EUV fluxes when solar activity is strong, and consequently the ionosphere of Venus extends into the magnetosheath, since more neutral particles are ionized.

- The results of wave modes around Venus (also reported by us in FRAENZ et al., 2017) are comparable with the result of the analysis of wave modes for Mars (RUHUNUSIRI et al., 2015a). In Venus, Alfvenic waves are dominating everywhere, mostly inside of the magnetosheath and in the upstream solar wind (>80%). Fast mode waves are observed around the bow shock and dayside of the MPB with a probability of up to 40%. Slow mode waves also can be observed in the bow shock and the MPB, but with a small probability (less than 10%). Mirror mode waves

are observed throughout the magnetosheath with probabilities between 10 and 20%, increasing towards the magnetic barrier.

This thesis contains several new results that, along with many previous works, can help to better understand the effect of plasma waves in the interaction of solar wind with induced magnetospheres. Even so, there are still many topics to be investigated about the influence of plasma waves in the atmospheric loss in this peculiar kind of magnetosphere. Some ideas of future works that can help us in this understanding arose in the development of this thesis; one of them is to conduct the study of the identification of ULF wave frequencies in the magnetosheath for Venus. Venus is closer to the Sun, and it has a denser atmosphere, it is bigger than Mars, and different than what occurs in Mars, solar cycle has an influence on the location of plasma boundaries (MARTINECZ et al., 2008; SHAN et al., 2015; XIAO et al., 2017). Thus, identifying the main frequencies there and investigating if there are changes of these frequencies with solar cycle and compare to the results found here for Mars will be very helpful. As a second idea we propose a detailed analysis of the 29 cases of potential wave penetration into the Martian ionopause using kurtosis and wavelet analyses. Kurtosis can help in the identification of energetic events in the magnetosheath that can help to identify wave activities in this region, which later can propagate to the ionospheric region. The wavelet transform can provide the main frequencies and parameters, which can be used to see whether the main frequencies in the magnetosheath are comparable with frequencies of oscillations in the ionosphere. As a last idea we propose the identification of the correlation length for specifics wave modes, therefore combining the two techniques developed in this thesis.

REFERENCES

ACUÑA, M. H.; CONNERNEY, J. E. P.; WASILEWSKI, P.; LIN, R. P.; ANDERSON, K. A.; CARLSON, C. W.; McFADDEN, J.; CURTIS, D. W.; MITCHELL, D.; REME, H.; MAZELLE, C.; SAUVAUD, J. A.; D'USTON, C.; CROS, A.; MEDALE, J. L.; BAUER, S. J.; CLOUTIER, P.; MAYHEW, M.; WINTERHALTER, D.; NESS, N. F. Magnetic field and plasma observations at Mars: initial results of the Mars Global Surveyor Mission. **Science,** v. 279, p. 1676-1680, 1998.

ACUNÃ, M. H.; CONNERNEY, J. E. P.; NESS, N. F.; LIN, R. P.; MITCHELL, D.; CARLSON, C. W.; McFADDEN, J.; ANDERSON, K. A.; RÈME, H.; MAZELLE, C.; VIGNES, D.; WASILEWSKI, P.; CLOUTIER, P. Global distribution of crustal magnetization discovered by the Mars Global Surveyor MAG/ER experiment. **Science,** v. 284, p. 790-793, 1999.

ACUNÃ, M. H.; CONNERNEY, J. E. P.; WASILEWSKI, P.; LIN, R. P.; MITCHELL, D.; ANDERSON, K. A.; CARLSON, C. W.; McFADDEN, J.; RÈME, H.; MAZELLE, C.; VIGNES, D.; BAUER, S. J.; CLOUTIER, P; NESS, N. F. Magnetic field of Mars: summary of results from the aerobraking and mapping orbits. **Journal of Geophysical Research,** v. 106, p. 23,403-23,417, 2001.

ANDREWS, D. J.; OPGENOORTH, H. J.; EDBERG, N. J. T.; ANDRÉ, M.; FRAENZ, M.; DUBININ, E.; DURU, F.; MORGAN, D.; WITESSE, O., Determination of local plasma densities with the MARSIS radar: asymmetries in the high-altitude martian ionosphere. **Journal of Geophysical Research**, v. 118, p. 6228-6242, 2013.

BARABASH, S.; LUNDIN, R.; ANDERSSON, H.; GIMHOLT, J.; HOLMSTRÖM, M.; NOBERG, O.; YAMAUCHI, M.; ASAMURA, K.; COATES, A. J.; LINDER, D. R.; KATARIA, D. O.; CURTIS, C. C.; HSIEH, K. C.; SANDEL, B. R. ; FEDOROV, A.; GRIGORIEV, A.; BUDNIK, E.; GRANDE, M.; SANDEL, B. R.; READING, D. H.; KOSKINEN, H.; KALLIO, E.; RIIHELA, P.; SÄLES, T.; KOZYRA, J.; KRUPP, N.; LIVI, S.; WOCH, J; LUHMANN, J.; MCKENNA-LAWLOR, S.; ORSINI, S.; CERULLI-IRILLI, R.; MAGGI, M.; MORBIDINI, A.; MURA, A.; MILILLO, A.; ROELO, E.; WILLIAMS, D.; SAUVAUD, J. –A.; THOCAVEN, J.-J.; MOREU, T.; WINNINGHAM, D.; FRAHM, R.; SCHERRER, J.; SHARBER, J.; WURZ, P.; BOCHSLER, P. **ASPERA-3: Analyser of space plasmas and energetic ions for Mars Express.** In: Mars Express: the scientific payload. Ed. by Andrew Wilson, scientific coordination: Agustin Chicarro. ESA SP-1240, Noordwijk, Netherlands: ESA Publications Division, ISBN 92-9092-556-6, p. 121 - 139, 2004.

BARABASH, S.; LUNDIN, R.; ANDERSSON, H.; BRINKFELDT, K.; GRIGORIEV, A.; GUNELL, H.; HOLMSTROEM, M.; YAMAUCHI, M.; ASAMURA, K.; BOCHSLER, P.; WURZ, P.; CERULLI-IRELLI, R.; MURA, A.; MILILLO, A.; MAGGI, M.; ORSINI, S.; COATES, A. J. LINDER, D.R.; KATARIA, O. D.; CURTIS, C. C.; HSIEH, K. C.; SANDEL, B. R.; FRAHM, R. A.; SHARBER, J. R.; WINNINGHAM, J. D.; GRANDE, M.; KALLIO, E.; KOSKINEN, H.; RIIHELAE, P.; SCHMIDT, W.; SAELES, T.; KOZYRA, J. U.; KRUPP, N.; WOCH, J.; LIVI, S.; LUHMANN, J. G.;. MCKENNA-LAWLOR, S.; ROELOF, E. C.; WILLIAMS, D. J.; SAUVAUD, J-A.; FEDOROV, A.; THOCAVEN, J-J. The Analyzer of Space Plasmas and Energetic Atoms (ASPERA-3) for the Mars Express mission. **Space Science Reviews**. v. 126, p. 113–164, 2006.

BARABASH, S. et al. ASPERA-4 : Analyser of Space Plasmas and Energetic Atoms. **Planetary and Space Science**, v. 55, p. 1772-1792, 2007.

BAUMJOHANN, W.; TREUMANN, R. A. **Basic Space Plasma Physics**, London, England: Imperial College, 2012, 329p.

BELCHER, J. W.; DAVIS, L., Large-amplitude Alfvén waves in the interplanetary medium,2. **Journal of Geophysical Research**, v. 76, p. 3534-3563, 1971.

BERTAUX, J-L.; LEBLANC, F.; WITASSE, O.; QUEMERAIS, E.; LILENSTEN, J.; STERN, S. A.; SANDEL, B.; KORABLEV, O. Discovery of an Aurora on Mars. **Nature,** v. 435, p. 790-794, 2005.

BERTUCCI, C.; MAZELLE, C.; SLAVIN, J. A.; RUSSELL, C. T.; ACUNÃ, M. H. Magnetic field draping enhancement at Venus: evidence for a magnetic pileup boundary. . **Geophysical Research Letters,** v. 30, n. 17, p.1876, 2003.

BERTUCCI, C.; MAZELLE, C.; ACUÑA, M. H.; RUSSELL, C. T.; SLAVIN, J. A. Structure of the magnetic pileup boundary at Mars and Venus. **Journal of Geophysical Resear**, v. 110, n.A01209, 2005.

BOESSWETTER, A.; BAGDONAT, T.; MOTSCHMANN, U.; SAUER, K. Plasma boundaries at Mars: a 3-D simulation study. **Annales Geophysicae,** v. 22, p. 4363–4379, 2004.

BOLZAM, M. J. A. Análise da transformada em ondeletas aplicada em sinal geofísico. **Revista Brasileira de Ensino de Física**, v. 26, p. 37-41, 2004.

BOLZAM, M. J. A.; VIERIA, P. C. Wavelet analysis of the wind velocity and temperature variability in the amazon forest. **Brazilian Journal of Physics**, v. 36, p. 1217-1222, 2006.

BRAIN, D. A. The bow shocks and upstream waves of Venus and Mars. **Advance in Space Research,** v. 33, p. 1913-1919, 2004.

BRAIN, D.A. Mars global surveyor measurements of the martian solar wind interaction. In: RUSSELL, C. T. (Ed.). **The Mars plasma environment**. Berlin: Springer, 2006. p. 77-112.

BRAIN, D.A.; BAKER, A.H.; BRIGGS, J.; EASTWOOD, J.P.; HALEKAS, J.S.;PHAN, T.D. Episodic detachment of Martian crustal magnetic fields leading to bulk atmospheric plasma to escape. **Geophysical Research Letters**, v.37, L14108, p.1-5, 2010.

BREUS, T. K.; BAUER, A. M.; KRYMSKII, A. M.; MITNITSKII, V. Y. Mass loading in the solar wind interaction with Venus and Mars. **Journal of Geophysical Research**, v. 94, p. 2375-2382, 1989.

BREUS, T. K.; KRYMSKII, A. M.; LUNDIN, R.; DUBININ, E. M.; LUHMANN, J. G.; YEROSHENK, YE. G.; BARABASH, S. V.; MITNITSKII, V. YA.; PISSARENKO, N. F.; STYASHKIN, V. A. The solar wind interaction with Mars: consideration of Phobos 2 Mission observations of an ion composition boundary on the dayside. **Journal of Geophysical Research**, v. 96, p.11,165-11,174, 1991.

CATTANEO, B. Evolution of mirror structures in the magnetosheath of Saturn from the bow shock to the magnetopause. **Journal of Geophyscal R Research**, v. 103, p. 11961-11972, 1998.

CHAI, L.; FRAENZ, M.; WAN, W.; RONG, Z.; ZHONG, J.; HAN, X.; BARABASH, S.. IMF Control of the location of venusian bow shock: the effect of the magnitude of IMF component tangential to the bow shock surface**. Journal of Geophysical Research Space Physics**, v.119, p. 9464-9475, 2014.

CHAI, L. et al. Solzar zenith angle-dependent asymmetries in venusian bow shock location revealed by Venus express. **Journal of Geophysical Research**, v. 120, p. 4446-4451, 2015.

CHICARRO, A.; MARTIN, P.; TRAUTNER, R. The Mars express mission: an overview. In: WILSON, A (Ed.). **Mars express**: the scientific payload. Noordwijk: ESA, 2004. p. 3-16.CLOUTIER, P. A.; DANIELL, R. E. JR. Ionospheric Currents Induced by Solar Wind Interaction with Planetary Atmospheres**. Planet. Spice Sci.** v. 21, p. 463-474, 1973.

CLOUTIER, P. A.; DANIELL JUNIOR, R. E. Ionospheric currents induced by solar wind interaction with planetary atmospheres**. Planetary and Space Science,** v. 21, p. 463-474, 1973.

CLOUTIER, P. A.; DANIELL JUNIOR, R. E. An electrodynamic model of the solar wind interaction with the ionospheres of Mars and Venus. **Planetary and Space Science**, v. 27, p. 1111-1121, 1979.

CONNERNEY, J. E. P.; ESPLEY, J.; LAWTON, P.; MURPHY, S.; ODOM, J.; OLIVERSEN, R.; SHEPPARD, D. The MAVEN magnetic field investigation. **Space Science Reviews**, v. 195, p. 257-291, 2015a.

CONNERNEY, J. E.P. et al. First results of the MAVEN magnetic field investigation. **Geophysical Research Letters**, v. 42, p. 1-9, 2015b.

DAS, A. C. Panetary Magnetospheres. **Pinsa**, A, n 3, p. 389-405, 1998.

DAUBECHIES, I. Ten lectures on wavelets. In: REGIONAL CONFERENCE SERIES IN APPLIED MATHEMATICS, 61., 1992, Philadelphia. **Proceedings...** 1992. ISBN 0898712742.

DELVA, M; DUBININ, E., Upstream ULF fluctuations near Mars. **Journal of Geophysical Research**, v. 100, p. 317-326, 1998.

DIÉVAL, C; KALLIO, E.; BARABASH, S.; STENBERG, G.; NILSSON, H.; FUTAANA, Y.; HOLMSTRÖM, M.; FEDOROV, A.; FRAHM, R. A.; JARVINEN, R.; BRAIN, D. A. A case study of proton precipitation at Mars: Mars express observations and hybrid simulation. **Journal of Geophysical Research**, 2011.

DONG, Y.; FANG, X.; BRAIN, D. A.; McFADDEN, J. P.; HALEKAS, J. S.; CONNERNEY, J. E.; CURRY, S. M.; HARADA, Y.; LUHMANN, J. G.; JAKOSKY, B. M. Strong plume fluxes at mars observed by MAVEN: an important planetary ion escape channel. **Geophysical Research Letters**, v. 42, p. 1-9, 2015.

DUBININ, E.; SAUER, K.; BAUMGARTEL, K.; LUNDIN, R. The martian magnetosheath: Phobos-2 observations. **Advances in Space Research**, v. 20, p.149-153, 1997.

DUBININ, E.; SAUER, K.; BAUMGAERTEL, K.; SRIVASTAVA, K. Multiple shocks near mars. **Earth Planets Space,** v. 50, p. 279-287, 1998.

DUBININ, E.; FRANZ, M.; WOCH, J.; ROUSSOS, A.; BARABASH, S.; LUNDIN, R.; WINNINGHAM, J. D.; FRAHM, R.; ACUÑA, M. Plasma morphology at Mars. ASPERA-3 observations. In: RUSSELL, C. (Ed.). **The Mars plasma environment**. Berlin: Springer, 2007. p.209-238.

DUBININ, E.; MODOLO, R.; FRAENZ, M.; WOCH, J.; CHANTEUR, G.; DURU, F.; AKALIN, F.; GURNETT, D.; LUNDIN, R.; BARABASH, S.; WINNINGHAM, J.D; FRAHM, R.; PLAUT, J. J.; PICARDI, G. Plasma environment of Mars as observed by simultaneous MEX-ASPERA-3 and MEX-MARSIS observations. **Journal of Geophysical Research,** v.113, n.A10217, p. 1-16, 2008.

DUBININ, E.; FRAENZ, M. Ultra-low-frequency waves at Venus and Mars. In: KEILING, A.; LEE, D. H.; NAKRIAKOV, V. (Eds.). **Low-frequency waves in space plasmas**. [S.l.]: American Geophysical Union, 2016.

DURU, F.; GURNETT, D. A.; MORGAN, D. D.; LUNDIN, R.; DURU, I. H.; WINNINGHAM, J. D.; FRAHM, R. A. Dayside episodic ion outflow from Martian magnetic cusps and/or magnetosheath boundary motion associated with plasma oscillations. **Geophysical Research Letters,** v. 41, p. 3344-3350, 2014.

ECHER, E. Planetary magnetosphere. **Revista Brasileira de Ensino de Física,** v.32,n.2, p. 230, 2010.

EDBERG, N. J. T.; LESTER, M.; COWLEY, S. W. H.; BRAIN, D. A.; FRAENZ, M,. BARABASH, S. Magnetosonic mach number effect of the position of the bow shock at Mars in comparison to Venus. **Journal of Geophysical Research**, v. 115, p. A07203-1- A07203-8, 2010.

ERGUN, R. E.; ANDERSSON, L.; PETERSON, W. K.; BRAIN, D.; DELORY, G. L.; METCHELL, D. L.; LIN, R. P.; YAU A. W. Role of plasma waves in Mars' atmospheric loss. **Geophysical Research Letters**, v. 33, L14103, 2006.

ERKAEV, N. V.; BOESSWETTER, A.; MOTSCHMANN, U.; BIERNAT, H. K. Aspects of solar wind interaction with Mars: comparison of fluid and hybrid simulations. **Annales Geophysicae**, v. 25, p. 145-159, 2007.

ESPLEY, J. R.; CLOUTIER, P. A.; BRAIN, D. A.; CRIDER, D. H.; ACUÑA, M. H. Observations of low-frequency magnetic oscillations in the Martian magnetosheath, magnetic pileup region and tail. **Journal of Geophysical Research,** v.109, p.1-12, 2004.

ESPLEY, J. R. The Martian magnetosphere: areas of unsettled terminology. **Journal of Geophysical Research: Space Physics**, v. 123, p. 4521–4525, 2018.

FLA, T.; HABBAL, S. R.; HOLZER, T. E.; LEER, E., Fast-mode magnetohydrodynamic waves in coronal holes and the solar wind. **The Astrophysical Journal**, v. 280, p. 382-390, 1984.

FISK, L. A.; SARI, J. W. Simultaneous observations of auroras from the south pole station and of precipitating electrons by Isis 1. **Journal of Geophysical Research**, v. 78, p. 6729-6736, 1973.

FOWLER, C. M.; ANDERSSON, L.; HALEKAS, J.; ESPLEY, J. R.; MAZELLE, C.; COUGHLIN, E. R.; ERGUN, R. E.; ANDREWS, D. J.; CONNERNEY, J. E. P.; JAKOSKY, B. Electric and magnetic variation in the near-mars environment. **Journal of Geophysical Research: Space Physics**, v. 122, p. 8536-8559, 2017.

FRAENZ, M.; DUBININ, E.; ROUSSOS, E.; WOCH, J.; WINNINGHAM, J. D.; FRAHM, R.; COATES, A. J.; FEDOROV, A.; BARABASH, S.; LUNDIN, R., Plasma moments in the environment of Mars: Mars express ASPERA-3 observations. **Space Science Reviews**, v. 126, p. 165-2207, 2006.

FRAENZ, M.; MOUIKIS, C.; MARGHITU, O.; SCHROEDER, O.; McFADDEN, J.; ROUSSOS, E.; PENOU, E. **CCATi Interface for Tplot data products software-package for Ampte IRM, cluster CIS, Galileo PLS MAVEN, messenger FIPS, MEX/VEX Aspera, PVO MAG, STEREO and the SPICE system.** [S.l: s.n.], 2016.

FRÄNZ, M.; ECHER, E.; MARQUES DE SOUZA, A.; DUBININ, E. ; ZHANG, T.L. Ultra-low frequency waves at Venus: observations by the Venus express spacecraft. **Planetary and Space Science**, v. 146, p. 55-65, 2017.

GARY, S. P.; WINSKE, D. Correlation function ratios and the identification of space plasma instabilities. **Journal of Geophysics**, v. 97, p. 3103-3111, 1992.

GLASSMEIR, K.-H.; ESPLEY, J. **ULF waves in planetary magnetospheres**. In: TAKAHASHI, K.; CHI, P. J.; LYSAK, R. L. (Eds.). **Magnetospheric ULF waves**: synthesis and new directions. [S.l.]: American Geophysical Union, Washington, 2006.

GOLD, T. Plasma and magnetic fields in the solar system. **Journal Of Geophysical Research,** v. 64, p. 1665-1674, 1959.

GREBOWSKY, J. M. Mars atmosphere and volatile evolution mission: science overvew. In: MAVEN COMMUNITY WORKSHOP, 2012, San Francisco. **Proceedings…** 2012.

GREENSTADT, E. W.; LE, G.; STRANGEWAY, R. J. ULF Waves in the foreshock. **Advances in Space Research,** v. 15, p. 71-84, 1995.

GREENSTADT, E. W. Dependence of shock structure at Venus and Mars on orientation of the interplanetary magnetic field. **Cosmic Electrondynamics,** v. 1, p. 380-388, 1970.

GREENSTADT, E. W.; OLSON, J. V.; LOEWEN, P. D.; SINGER, H. J.; RUSSELL, C. T. Correlation of Pc 3,4 and 5 activity with solar wind speed. **Journal of Geophysical Research**, v. 84, p. 6694-6696, 1979.

GRUNELL, H. et al. Shear driven waves in the induced magnetosphere of Mars. **Plasma Physics and Controlled Fusion**, v. 50, 1-9, 2008.

GUICKING, L.; GLASSMEIR, K. H.; AUSTER, H. U.; DELVA, M.; MOTSCHMANN, U.; NARITA, Y.; ZHANG, T. L. Low-frequency magnetic field fluctuations in Venus' solar wind interaction region: Venus express observations. **Annales Geophysicae**, v. 28, p. 951-967, 2010.

GURNETT, D. A.; KIRCHNER, D. L.; HUFF, R. L.; MORGAN, D. D.; PERSOON, A. M.; AVERKAMP, T. F..; DUR, F.; NIELSEN, E.; SAFAEINILI, A.; PLAUT, J. J.; PICARDI, G. Radar soundings of the ionosphere of Mars. **Science**, v. 310, p. 1929-1933, 2005.

HALEKAS, J. S. et al. The solar wind ion analyzer for MAVEN. **Space Science Reviews**, v. 195, p. 125-151, 2013.

HALEKAS, J. S. et al. Structure, dynamics, and seasonal variability of the Mars-solar wind interaction: MAVEN solar wind ion analyzer in-flight performance and science results. **Journal of Geophysical Research Space Physics**, v. 121, p.1-32, 2016.

HAN, X. et al. Discrepancy between ionopause and photoelectron boundary determined from Mars boundary determined from Mars express measurements. **Geophysical Research Letters**, v. 41, p. 8221-8227, 2014.

HOWES, G.G.; BALE, S. D.; KLEIN, K. G.; CHEN, C. H. K.; SALEM, C. S.; TenBARGE, J. M. The slow-mode nature of compressible wave power in solar wind turbulence. **The Astrophysical Journal Letters**, v.753, p.1-4, 2012.

HUBA, J. D. **NRL plasma formulary**. Washington, DC: Naval Research Laboratory, 2013.

HUBBARD, B. B. **The world according to wavelets**: the story of a mathematical technique in the making. [S.l.]: A K Peters, 1995. p.5-51.

JAKOSKY, B. M. et al. The Mars Atmosphere and Volatile Evolution (MAVEN) mission to Mars. **Space Science Reviews**, v. 195, p. 3-48, 2015.

JOKIPPI, J. R.; COLEMAN, P. J. Cosmic-ray diffusion tensor and its variation observed with Mariner 4. **Journal ofGeophysical Research**, v. 73, p.7221, 1968.

KAUFMANN, R.L.; HORNG, J.T.; WOLFE, A. Large-amplitude hydromagnetic waves in the inner magnetosheath. **Journal of Geophysical Research**, v.75, p. 4666, 1970.

KALLIO, E.; CHAUFRAY, J-Y.; MODOLO, R.; SNOWDEN D.; WINGLEE, R. Modelling of Venus, Mars and Titan. **Space Science Reviews**, v. 162, p. 267-307, 2011.

KEITH, W. R. **Development of an ion/electron plasma spectrometer**. Houston: Rice University, 1999.

KHURUNA, K. K.; KILVELSON, M. G., Ultralow frequency MHD waves in Jupiter's middle magnetosphere. **Journal of Geophysical Research**, v. 94, p. 5241-5254, 1989.

KHURANA, K. K., KIVELSON, M. G. A variable cross-section model of the bow shock of Venus, **Journal of Geophysical Research**, v. 99, p. 8505-8512, 1994.

KIVILSON, M. G. Pulsations and magnetohydrodynamic waves. In: KIVELSON, M. G.; RUSSELL. C. T. (Eds.). **Introduction to space physics**. [S.l.: s.n.], 1995. p. 1875-1883.

KIVELSON, M. G.; BAGENAL, F. . Planetary magnetospheres. In: MACFADDEN, L. A.; WEISSMAN, P. R.; JOHNSON, T. V. (Eds.). **Encyclopedia of the solar system**. San Diego, CA: Academic, 2007. p.519-539.

KOFKE, D. A. **CE 530 molecular simulation**. Available from: <http://www.eng.buffalo.edu/~kofke/ce530/Lectures/Lecture12/sld010.htm> Access in: 12 Sept. 2018.

KULSRUD, R. **Plasma physics for astrophysics.** Princeton, NJ: Princeton University Press, 2005.

KUMAR, P.; GEORGIOU, E. F. Wavelet analysis in geophysics: an introduction. In: GEORGIOU E. F.; KUMAR, P. (Eds.). **Wavelets in geophysics**. San Diego: Academic, 1994. p. 1–43.

LE, G.; RUSSELL, C. T. A study of ULF wave foreshock morphology: ULF foreshock boundary. **Planetary Space Science**, v. 40, p. 1203-1213, 1992.

LUHMANN, J. G. The solar wind interaction with Venus. **Space Science Reviews**, v. 44, p. 241-306, 1986.

LUHMANN, J. G. et al. Characteristics of the Mars-like limit of the Venus-solar wind interaction. **Journal of Geophysical Research**, v. 92, p. 8545-8557, 1987.

LUHMANN, J. G.; RUSSELL, C. T.; BRACE, L. H.; VAISBERG, O. L. The intrinsic magnetic field and solar-wind interaction of Mars. **Mars**, p. 1090-1134, 1992.

LUHMANN, J. G.; LEDVINA, S. A.; RUSSELL, C. T. Induced magnetospheres. **Advances in Space Research,** v. 33, p. 1905–1912, 2004.

LUNDIN, R.; ZAKHAROV, A.; PELLINEN, R.; BARABASJ, S. W.; BORG, H.; DUBININ, E. M.; HULTQVIST, B.; KOSKINEN, H.; LIEDE, I.; PISSARENKO, N.; ASPERA/ phobos measurements of the ion outflow from the Martian ionosphere. **Geophysical Research Letters**, v.17, p.873 – 876, 1990.

LUNDIN, R.; BARABASH, S.; Evolution of the Martian atmosphere and hydrosphere: solar wind erosion studied by ASPERA-3 on Mars Express. **Planetary and Space Science,** v. 52, p.1059-1071, 2004.

LUNDIN, R. et al. Ionospheric plasma acceleration at Mars: ASPERA-3 results. **Icarus,** v.182, p.308– 319, 2006.

LUNDIN, R.; BARABASH, S.; HOLMSTRO,M.; NILSSON, H.; YAMAUCHI, M.; FRAENZ, M.; DUBININ, E. M. A comet-like escape of ionospheric plasma from Mars. **Geophphysical Research Letters**, v.35, p.1-5, 2008.

LUNDIN, R.; BARABASH, S.; DUBININ, E.; WINNINGHAM, D.; YAMAUCHI, M. Low-altitude acceleration of ionospheric ions at Mars. **Geophysical Research Letters,** v.38, p.1-11, 2011.

LUNDIN R. et al. Solar cycle effects on the ion escape from Mars. **Geophysical Research Letters**, v. 40, p. 6028-6032, 2013.

MA, Y.-J.; ALTWEGG, K.; BREUS, T.; COMBI, M. R.; CRAVENS, T. E.; KALLIO, E.; LEAVINA, S. A.; LUHMANN, J. G.; MILLER, S.; NAGY, A. F.; RIDLEY, A. J.; STROBEL, D. F. Plasma flow and related phenomena in planetary aeronomy. **Space Science Review,** v.139, n.1/4, 2008. DOI: 10.1007/s11214-008-9389-1.

MAHAJAN, K. K. Planetary ionospheres: the Venus ionopause. **NISCAIR-CSIR**, v. 24, p. 269-279, 1995.

MARTINECZS, C.; FRAENZ, M.; WOCH, J.; KRUPP, N.; ROUSSOS, E.; DUBININ, E.; MOTSCHMANN, U.; BARABASH, S.; LUNDIN, R.; HOLMSTROEM, M.; ANDERSSON, H.; YAMAUSHI, M.; GRIGORIEV, A.; FUTAANA, Y.; BRINKFELDT, K.; GUNELL, H.; FRAHM, R. A.; WINNINGHAM, J. D.; LAMMER, H. Location of the bow shock and ion compositon boundaries at Venus-initial determinations from Venus express Aspera-4. **Planetary and Space Science**, v. 56, p. 780-784, 2008.

MARTINECZS, C. et al. Plasma environment of Venus: comparison of Venus Express ASPERA-4 measurements with 3-D hybrid simulations. **Journal of Geophysical Research**, v.114, E00B30, 2009.

MELA, K.; LOUIE, J. N. Correlation length and fractal dimension interpretation from seismic data using variograms and power spectra. **Geophysics**, v. 66, p. 1372-1378, 2001.

MITCHELL, D. L.; LIN, R. P.; MAZELLE, C.; RÈMA, H.; CLOUTIER, P. A.; CONNERNEY, J. E. P.; ACUÑA, M. H.; NESS, N. F. Probing Mars' crustal magnetic field and ionosphere with the MGS electron reflectometer. **Journal of Geophysical Research,** v. 106, p.23,419-23,427, 2001.

MITCHELL, D. L. et al. The MAVEN solar wind electron analyzer. **Space Science Reviews**, v. 200, p. 495-528, 2016.

MODOLO, R.; CHANTEUR, G. M.; DUBININ, E.; MATTHEUWS, A. P. Influence of the solar EUV flux on the martian plasma environment. **Annales Geophysicae**, v. 23, p. 433-444, 2005.

MORALES, J. J; NUEVO, M. J. Physical meaning of the time-correlation length obtained in a computer simulations. **Physical Review E**, v. 48, p. 1550-1553, 1993.

MORETTIN, P. A. **Ondas e ondeletas**: da análise de Fourier à análise de ondeletas. São Paulo: Edusp, 1992. 296 p.

MOSES, S. F.; CORONITI, F. V.; SCARF, F.L. Expectations for the microphysics of the Mars-Solar wind interaction. **Geophysical Research Letters**, v. 15, p. 429-432, 1988.

NAGY, A.F.; WINTERHALTER, D.; SAUER, K.; CRAVENS, T.E.; BRECHT,S.; MAZELLE, C.; CRIDER, D.; KALLIO, E.; ZAKHAROV, E.; DUBININ, E.; VERIGIN, M.; KOTOVA, G.; AXFORD, W.I.; BERTUCCI, C. ; TROTIGNON, J.G. The plasma environment of Mars. **Space Science Reviews,** v.111, p. 33–114, 2004.

NASA/LASP, SWEA electron path diagram. Available from: <http://spaceflight101.com/maven/instrument-overview/> Access in: 10 Sept. 2018.

NOAA. Sunspot number progression. 2016. Available from: <http://www.swpc.noaa.gov/products/solar-cycle-progression> Access in: 13 Nov. 2016.

OSMANE, A.; DIMMOCK, A.; NADERPOUR, R.; PULKKINEN, T.; NYKYRI, A., The impact of solar wind ULF Bz fluctuations on geomagnetic activity for viscous timescales during strongly northward and southward IMF. **Journal of Geophysical Research: Space Physics**, v. 120, p. 9307-9322, 2015.

PALUMBO, D. Determining correlation and coherence lengths in turbulent boundary layer flight data. **Journal of Sound and Vibration**, v.331, p.3721-3737, 2012.

PARKS, G. K. **Physics of space plasmas:** an introduction. Boulder: Westview Press, 2004. 538 p.

PARPHI, S.; BIEBER, J. W.; MATTHAEUS, W. H.; BURGER, R. A. Sensitivity of cosmic ray modulation to the correlation length. **Geophysical Research Letters**, v. 29, p. 99-1-99-3, 2002.

PATER, I.; LISSAUER, J. J. **Planetary Sciences**. 2. ed., Cambridge university press, New York, 2010,p.

PICARD, G.; BICCARI, D.; SEU, R.; PLAUT, J.; JOHNSON, W.T.K.; JORDAN, R.L.; SAFAEINILI, A.; GURNETT, D.A.; HUFF, R.; OROSEI, R.; BOMBACI, O.; CALABRESE, D.; ZAMPOLINI, E. MARSIS: Mars advanced radar for subsurface and ionosphere sounding. In: WILSON, A. (Ed.). **Mars Express**: the scientific payload. Noordwijk : ESA, 2004. p. 50-69.

PICARD, G.; BICCARI, D.; CARTACCI, M.; CICCHETTI, A.; FUGO, O.; GIUPPI, S.; MASDEA, A.; NOSCHESE, R.; SEU, R.; FEDERICO, C.; FRIGERI, A.; MELACCI, P. T.; OROSEI, R.; BOMBACI, O.; CALABRESE, D.; ZAMPOLINI, E.; MARINANGELI, L.; PETTINELLI, E.; FLAMINI, E.; VANNARONI, G. MARSIS, a radar for the study of the Martian subsurfice in the Mars Express mission. **Memorie della Società Astronomica Italiana,** v.11, p.15-25, 2007.

PHILLIPS, J. L.; LUHMANN, J. G.; RUSSELL, C. T. Dependence of Venus ionopause altitude and ionospheric magnetic field on solar wind dynamic pressure. **Advance in Space Research**, v.5, p.173-176, 1985.

PODGORNY, I. M.; DUBININ, E. M.; ISRAELEVICH, P. L. Laboratory simulation of the induced magnetospheres of comets and Venus. **The Moon and the Planets**, v.23, p.323-338, 1980.

POKHOTELOV, D.; RAE, I. J.; MURPHY, K. R.; MANN, I. R. The influence of solar wind variability on magnetospheric ULF wave power. **Annales Geophysicae Communications**, v.33, p.697-701, 2015.

POPE, S. A.; BALIKHIN, M. A.; ZHANG, T. I.; FEDOROV, A. O.; GEDALIN, M.; BARABASH, S. Giant vorticies lead to ion escape from Venus and re-distribution of plasma in the ionosphere. **Geophysical Research Letters**, v.36, p.L07202, p.1-4, 2009.

POTAPOV, A. V. ULF wave activity in high-speed streams of the solar wind: impact on the magnetosphere. **Journal of Geophysical Research**, v. 118, p. 64656477, 2013.

RAMSTAD, R.; BARABASH, S.; FUTAANA, Y.; HOLMSTOEM, M. Solar wind- and EUV-dependent models for the shapes of the Martian plasma boundaries based on Mars Express measurements. **Journal of Geophysical Research**, v.122, p.7279-7290, 2017.

RUHUNUSIRI, S.; HALEKAS, J. S.; CONNERNEY, J. E. P.; ESPLEY, J. R.; McFADDEN, J. P.; LARSON, D. E.; MITCHELL, D. L.; MAZELLE, C.; JAKOSKY, B. M.; Low-frequency Waves in the Martian magnetosphere and their response to upstream solar wind driving conditions. **Geophysical Research Letters,** v.42, p.8917-8924, 2015a.

RUHUNUSIRI, S.; HALEKAS, J. S.; CONNERNEY, J. E. P.; ESPLEY, J.; LARSON, D.; MITCHELL, D. L. MAVEN characterization of low-frequency plasma waves in the Martian magnetosphere. **Lunar and Planetary Science Conference**, v. 46, p. 1- 2, 2015b.

RUSSELL, C. T.; ELPHIC, R. C.; SLAVIN, J. A. Initial pioneer Venus magnetic field results: nightside observations. **Science**, v.205, p.114-116, 1979.

RUSSELL, C. T.; CHOU, E.; LUHMANN, G.; GAZIS, P.; BRACE, L. H.; HOEGY, W. R. Solar and interplanetary control of the location of the Venus bow shock. **Journal of Geophysical Research**, v. 93, p.5461-5469, 1988.

RUSSELL, C.T.; SONG, P.; LEPPING, R. P. The Uranian magnetopause: lessons from Earth. **Geophysical Research Letters**. v. 16, p. 1485-1488, 1989.

RUSSELL, C. T.; LUHMANN, J. G.; SCHWINGENSCHUH, K.; RIEDLER, W.; YEROSHENKO, Y. Upstream waves at Mars: phobos observations. **Geophysical Research Letters**, v. 17, p. 897-900, 1990.

RUSSELL, C. T.; LUHMANN, J. G.; STRANGEWAY, R. J. The solar wind interaction with Venus through the eyes of the pioneer Venus orbiter. **Planetary and Space Science**, v.54, p.1482-1495, 2006.

SABLIK, M. J.; GOLIMOWSKI, D.; SHARBER, J. R.; WINNINGHAM, J. D. Computer simulation of a 306º field-of-view "Top-Hat" electrostatic analyzer. **Review of Scientific Instruments,** v.59, p.146-155, 1988.

SAGDEEV, R. Z.; ZAKHAROV, A. V. Brief history of the Phobos mission. **Nature**, v. 341, p. 581-585, 1989.

SANCHES-CANO, B.; HALL, B. E. S.; LESTER, M.; MAYS, M. L.; WITASSE, O.; ANDREWS, D.; CARTACCI, M.; CICCHETTI, A.; HOLMSTROEM, M.; IMBER, S.; KAJDIC, P.; MILAN, S. E.; NOSCHESE, R.; ODSTRCIL, D.; OPGENOORTH, H.; PLAUT, J.; RAMSTAD, R.; REYES-AYALA, K. I. Mars plasma system response to solar wind disturbances during solar minimum. **Journal of Geophysical Research**, v. 122, p. 6611-6634, 2017.

SAUER, K.; DUBININ, E.; BAUMGARTEL, K. Nonlinear MHD waves and discontinuities in the Martian magnetosheath observations and 2D bi-ion MHD simulations. **Earth Planets Space,** v.50, p.793-801, 1998.

SAUNDERS, M. A.; RUSSELL, C. T., Average dimension and magnetic structure of the distant Venus magnetotail. **Journal of Geophysical Research**, v. 91, p. 5589-5604, 1986.

SCHWINGENSCHUH, K.; RIEDLER, W.; LICHTENEGGER, H.; YEROSHENKO, Y.; SAUER, K.; LUHMANN, J. G.; ONG, M.; RUSSELL, T. Martian bow shock: phobos observations. **Geophysical Research Letters**, v. 17, n. 6, p. 889-892, 1990.

SCHWINGENSCHUH, K.; RIEDLER, W.; ZHANG, T. L.; LICHTENEGEER, H.; ROSENBAUER, H.; LIVI, S.; GEVAI, G.; GRINGAUZ, K.; VERIGIN, M.; YEROSHENKO, YE.; MOHLMANN, D.; ROATSCH, TH.; LUNDIN, R.; RUSSELL, C. T.; LUHMANN, J. G. The matian magnetic field environment: induced or dominated by an intrinsic magnetic field? **Advances in Space Research,** v.12, n. 9, p. 213-219, 1992.

SARAIVA, C. Solar Wind Electron Analyzer (SWEA). 2012. Available from; <http://lasp.colorado.edu/home/maven/science/instrument-package/swea/> Access in: 10 Sept. 2018.

SALEM, A. Image compression using wavelet and subband based transform. 2014. Available from: <http:qqwww.researchgate.net./Figure-6-using-variable-window-length-size-in-wavelet-subbands-while-use-fixed-window-fig5-319764377> Access in: 10 Sept. 2018.

SCIFFER, M. D.; WATERS, C. L.; MENK, F. W. Propagation of ULF waves through the ionosphere: inductive effect of oblique magnetic field. **Annales Geophysicae**, v. 22, p. 1155-1169, 2004.

SHAN, L.; LU, Q.; MAZELLE, C.; HUANG, C.; ZHANG, T.; WU, M.; GAO, X.; WANG, S. The shape of the venusian bow shock at solar minimum and maximum: revisit based on VEX observations. **Planetary and Space Science**, v.109/110, p. 32-37, 2015.

SHAN, L.; MAZELLE, C.; MEZIANE, K.; DELVA, M.; LU, Q.; GE, Y. S.; DU, A.; ZHANG, T. Characteristics of quasi-monochromatic ULF waves in the venusian foreshock, **Journal of Geophysical Research: Space Physics,** v.121, p.7385-7397, 2016.

SIVAC, P.; SCHIRMANN, T. The Venus Express spacecraft system design. In: WILSON, A. (Ed.). **Venus Express**. [S.l.]: European Space Agency, 2009.

SLAVIN, J. A.; ELPHIC, R. C.; RUSSELL, C. T.; WOLFE, J. H. INTRILLIGATER, D. S. Position and shape of the Venus bow shock: pionner Venus orbiter observations. **Geophysical Research Letters**, v.6, p.901-904. 1979.

SONG, P.; RUSSELL, C. T.; GARY, S. P., Identification of low-frequency fluctuation in the terrestrial magnetosheath. **Journal of Geophysical Research**, v. 99, p. 6011-6025, 1994.

SOUZA, A. M.; ECHER, E.; BOLZAN, M. J. A.; HAJRA, R. A study on the main periodicities in interplanetary magnetic field Bz component and geomagnetic AE index during HILDCAA events using wavelet analysis. **Journal of Atmospheric and Solar-Terrestrial Physics**, v. 149, p. 81-86, 2016. DOI: 10.1016/j.jastp.2016.09.006.

SPREITER, J. R.; ALKSNE A.Y. Plasma flow around the magnetosphere. In: WILLIAMS, D. J.; MEAD, G. D. (Eds.). **Magnetospheric physics**. Washington, D.C.: American Geophysical Union, 1969. p. 11-50.

STEFAN, R. **Mars**: electric atmosphere. 2008. Available from: <http://www.thunderbolts.info/forum/phpBB3/viewtopic.php?f=4&t=761>. Access in: 12 Sept. 2018.

SUMMERS, D.; MA, C-Y. Rapid acceleration of electrons in the magnetosphere by fast-mode MHD waves. **Journal of Geophysical Research**, v.105, p.15,887-15,895, 2000.

SVEDHEM, H. et al. Venus Express: mission overview. In: WILSON, A. (Ed.). **Venus Express.** [S.l.]: European Space Agency, 2009.

TAKAHASHI, K.; CHI, P.J.; LYSAK, R. L. **Magnetospheric ULF waves: s**ynthesis and new directions. Washington: American Geophysical Union, 2006.

TARASOV, V.; DUBININ, E.; PERRAUT, S.; ROUX, A.; SAUER, K.; SKALSKY, A.; DELVA, M. Wavelet application to the magnetic field turbulence in the upestream region of the Martian bow shock. **Earth, Planets and Space**, v. 50, p. 699-708, 1998.

TITOV, D.V.; LELLOUCH, F.W.; MARINANGELI, L.; OPGENOORTH, H. **Venus Express**: an orbiter for the study of the atmosphere, the plasma environment, and the surface of Venus, mission definition report. [S.l.]: ESA, 2001.

TORRENCE, C.; COMPO, G. P. A practical guide to wavelet analysis. **Bulletin of the American Meteorological Society,** v. 79, n. 1, p. 61-78, 1998.

TROTIGNON, J. G. et al. Position and shape of the martian bow shock: the Phobos-2 plasma wave system observations. **Planetary and Space Science**, v. 41, p. 189-198, 1993.

TROTIGNON, J. G.; MAZELLE, C.; BERTUCCI, C.; ACUÑA, M. H. Martian shock and magnetic pile-up boundary positions and shapes determined from the Phobos 2 and Mars global surveyor data sets. **Planetary and Space Science**, v. 54, p. 357-369, 2006.

TSURUTANI,B .T.; SOUTHWOODE, D. J.; SMITH, J.; BALOGH, A. A survey of low-frequency(LF) waves at Jupiter: the Ulysses encounter. **Journal of Geophysical Research**, v. 98, p. 203, 1993.

TSURUTANI, B.T.; GONZALEZ, W.D.; GONZALEZ, A.L.C.; GUARNIERI, F.L.; GOPALSWAMY, N.; GRANDE, M.; KAMIDE, Y.; KASAHARA, Y.; LU, G.; MANN, I.; MCPHERRON, R.; SORAAS, F.; VASYLIUNAS, V. Corotating solar wind streams and recurrent geomagnetic activity: a review. **Journal of Geophysical Research**, v.111, p. 1-25, 2006.

TSURUTANI, B. T.; LAKHINA, G. S.; VERKHOGLYADOVA, O. P.; ECHER, E.; GUARNIERI, F. L.; NARITA, Y.; CONSTANTINESCU, D. O. Magnetosheath and heliosheath mirror mode structures, interplanetary magnetic structures, and linear magnetic decreases: differences and distinguishing features. **Solar and Heliospheric Physics**, v. 116, p. A02103-1-A02103-16, 2011.

VAISBERG, O L.; ZELENY, L. M. Formation of the plasma mantle in the venusian magnetosphere. **Icarus**, v. 58, p. 412-430, 1984.

VELLANTE, M. U.; VILANTE, L.; SANTARELLI, L.; LAURETIS, M. Propagation characteristics of ULF waves in the Earth's magnetosphere as inferred by an analysis of polarization parameters of geomagnetic pulsations at a low-latitude station, **Proc. "SOLSPA; The Second Solar Cycle and Space Weather Euroconference**, ESA, p. 4.91-494, 2002.

VIGNES, D.; MAZELLE, C; RME, H.; ACUÑA, M. H.; CONNERNEY, J. E. P.; LIN, R. P.; MITCHELL, D. L.; CLOUTIER, P.; CRIDER, D. H.; NESS, N. F. The solar wind interaction with Mars: locations and shapes of the Bow Shock and the magnetic pile-up boundary from the observations of the MAG/ER experiment onboard Mars Global Surveyor. **Geophysical Research Letters**, v. 27, p. 49-52, 2000.

VIGNES, D. et al. Factors controlling the location of the bow shock at Mars. **Geophysical Research Letters**, v. 29, p. 42-1-42-4, 2002.

VOLWERK, M.; ZHANG, T.L.; DELVA, M.; V€OR€OS, Z.; BAUMJOHANN, W.; GLASSMEIER, K.H. First identification of mirror mode waves in Venus's magnetosheath. **Geophysical Research Letters**, v. 35, L12204, 2008.

XIAO, S. D.; ZHANG, T. L.; WANG, G. Q. Statistical study of low-frequency magnetic field fluctuations near Venus during the solar cycle. **Journal of Geophysical Research: Space Physics**, v.122, p.8409-8418, 2017.

WICKS, R. T.; OWENS, M. J.; HORBURY, T. S. The variation of solar wind correlation lengths over three solar cycles. **Solar Physics**, v.262, p.191-198, 2010.

WINNINGHAM, J. D.; FRAHM, R. A.; SHARBER , J. R.; COATES, A. J.; LINDER, D. R.; SOOBIAH, Y.; KALLIO, E.; ESPLEY, J.R.; LUNDIN, R,; BARABASH, S.; HOLMSTRÖM, M.;ANDERSSON, H.; YAMAUCHI, M.; GRIGORIEV, A .; SCHERRER, J. R.; JEFFERS , S. J.; KATARIA, D. O.; KOZYRA, J. U.; LUHMANN, J. G.; ROELOF, E. C.; WILLIAMS, D. J.;LIVI, S.;CURTISI, C. C.; HSIEH, K. C.; SANDEL, B. R.; KOSKINENJ, H.; SÄLES, T.;RIIHELÄ, P.; SCHMIDT, W.; GRANDE, M.; CARTER, M.;SAUVAUD, J. -A.; FEDOROV, A.;THOCAVEN, J.-J.; MCKENNA-LAWLER, S.; ORSINI, S.;CERULLI-IRELLI, R.; MAGGI, M.;WURZ , P.;BOCHSLER, P.; KRUPP, N.;WOCH, J.; FRÄNZ, M.; SAMURA, K.;DIERKER, C. Electron oscillations in the induced martian magnetosphere. **Icarus,** v.182, p.360–370, 2006.

WRIGHT, A. N. ; MANN, I. R.,**Global MHD eigenmodes of the outer magnetosphere**. In: Magnetospheric ULF Waves : Synthesis and New Directions,. Ed. by: TAKAHASHI; K., CHI, P. J.; LYSAK, R. L. AMERICAN Geophysical Union, Washington, 2006, p. 51-72.

YOUNG, R.K. **Wavelet theory and its applications**. Boston: Springer, 1993.

ZHANG, T. L.; LUHMANN, J. G.; RUSSELL, C. T. The magnetic barrier at Venus. **Journal of Geophysical Research**, v.96, p.11,145-11,153, 1991.

ZHANG T. L. et al. Magnetic field investigation of the Venus plasma environment: expeted new results. **Planetary Space Science**, v. 54, p. 1336-1343, 2006.

ZHANG, T. L. et al. Induced magnetosphere and its outer boundary at Venus. **Journal of Geophysical Research: Planets**, v. 113, E00B20, 2008. DOI: https://doi.org/10.1029/2008JE003215.

APENDICE A – MARS PLASMA BOUNDARIES LIST

The list with the MEX plasma boundaries identified between the years 2014 and 2016 is presented below (A1- 2014, A2- 2015 and A3- 2016). As mentioned in the identification boundaries analysis, each boundary is represented by number, where: 1 to 3 represent the inbound BS, MPB and PEB, respectively, and 4 (PEB), 5 (MPB) and 6 (BS) represent those outbound boundaries. The list presents the time that the spacecraft crossed the boundary, the number that represents the boundary and y and z values.

A1- List of plasma boundaries 2014

```
# CCATi boundary location file: time bndnum yvalue zvalue
2014-01-01/06:28:58       5      9.16646      90.0000
2014-01-02/00:51:43       1      16.9008      66.0000
2014-01-02/03:52:49       6      1700.30      979.000
2014-01-02/10:44:56       6      4.97160      3.00000
2014-01-02/17:43:18       6      26.7415      135.000
2014-01-03/00:43:58       6      33.6376      193.000
2014-01-03/12:00:59       1      11.5303      120.000
2014-01-03/14:39:33       6      15005.6      0.00000
2014-01-03/19:17:19       1      1.46247      3.00000
2014-01-03/21:37:18       6      15.6565      76.0000
2014-01-06/17:09:27       1      6845.60      2.00000
2014-01-06/19:24:59       6      227.590      17.0000
2014-01-07/00:03:01       1      5.79326      4.00000
2014-01-07/02:27:41       5      31.1610      160.000
2014-01-07/07:02:06       1      2867.70      99.0000
2014-01-07/08:02:54       2      295.000      48.0000
2014-01-07/08:50:55       4      11.6000      122.000
2014-01-07/09:13:19       5      9.50000      0.00000
2014-01-07/09:29:43       6      13.4359      30.0000
2014-01-10/04:36:00       1      4.97160      15.0000
2014-01-10/06:04:59       2      181.700      251.000
2014-01-10/06:33:47       3      147.700      225.000
2014-01-10/07:19:58       6      31.1610      286.000
2014-01-10/11:48:42       1      2.49792      5.00000
2014-01-10/14:23:11       6      714.300      556.000
2014-01-10/20:14:00       2      11.6000      231.000
2014-01-10/21:21:12       6      227.000      0.00000
2014-01-11/03:15:55       2      23.8000      435.000
2014-01-11/04:16:44       5      15005.6      0.00000
2014-01-11/15:23:04       1      646.300      207.000
2014-01-12/07:42:32       4      7.40000      3130.00
2014-01-12/07:55:20       5      7.40000      183.000
2014-01-12/13:54:03       2      3.20000      53.0000
2014-01-12/14:22:51       3      3.20000      42.0000
```

2014-01-12/14:35:39	4	5.30000	65.0000
2014-01-12/14:58:04	5	3.20000	0.00000
2014-01-12/22:19:59	6	147.700	0.00000
2014-01-16/02:53:39	5	7.40000	112.000
2014-01-16/03:28:51	6	17.9000	104.000
2014-01-16/07:15:01	1	33.7000	79.0000
2014-01-16/09:16:39	4	1.00000	26.0000
2014-01-16/09:48:39	5	1.00000	66.0000
2014-01-16/10:07:51	6	1099.70	155.000
2014-01-21/14:41:47	3	5.30000	119.000
2014-01-21/15:01:00	4	3.20000	34.0000
2014-01-21/15:39:24	5	3.20000	127.000
2014-01-24/11:03:09	1	13.7000	82.0000
2014-01-24/13:07:59	4	3.20000	34.0000
2014-01-24/13:39:59	5	3.20000	60.0000
2014-01-26/19:24:12	1	28.3000	118.000
2014-01-27/16:03:30	1	215.700	859.000
2014-01-27/18:37:02	6	1.98581	5.00000
2014-01-28/15:00:52	4	5.30000	79.0000
2014-01-28/15:20:04	5	5.30000	84.0000
2014-01-28/15:32:52	6	13.7000	90.0000
2014-01-28/20:01:10	1	3.20000	142.000
2014-01-28/21:56:23	4	5.30000	41.0000
2014-01-28/22:12:24	5	7.40000	294.000
2014-01-28/22:34:48	6	227.000	211.000
2014-01-29/19:13:44	5	7.40000	66.0000
2014-01-30/09:18:27	5	3.20000	117.000
2014-01-30/09:40:52	6	5.30000	104.000
2014-01-31/13:13:05	5	5.30000	123.000
2014-01-31/13:29:05	6	95.9000	115.000
2014-01-31/17:39:31	1	11.6000	169.000
2014-01-31/19:37:57	4	1.00000	39.0000
2014-01-31/20:35:33	6	2210.30	128.000
2014-02-02/11:53:07	1	8148.90	97.0000
2014-02-02/14:13:57	5	3.20000	89.0000
2014-02-03/15:39:58	1	36.3110	164.000
2014-02-03/18:23:30	6	601.000	581.000
2014-02-03/23:59:13	2	5.30000	75.0000
2014-02-04/00:08:50	3	5.30000	29.0000
2014-02-04/01:06:26	5	9.50000	698.000
2014-02-04/01:25:38	6	159.000	70.0000
2014-02-04/07:05:41	2	9.50000	152.000
2014-02-04/07:28:05	3	7.40000	41.0000
2014-02-04/07:44:05	4	5.30000	86.0000
2014-02-04/08:06:30	5	5.30000	107.000
2014-02-04/08:28:54	6	11.6000	109.000
2014-02-04/14:00:54	2	9.50000	283.000
2014-02-04/14:32:54	3	11.6000	129.000
2014-02-04/14:45:42	4	9.50000	339.000
2014-02-04/15:08:06	5	7.40000	72.0000
2014-02-04/15:30:30	6	87.9000	69.0000
2014-02-04/19:45:01	1	2.49792	2.00000
2014-02-04/21:36:09	4	3.20000	27.0000

2014-02-04/22:04:58	5	3.20000	38.0000
2014-02-04/22:19:21	6	33.6376	87.0000
2014-02-05/02:46:36	1	7.40000	34.0000
2014-02-05/04:00:13	2	7.40000	47.0000
2014-02-05/05:18:18	6	1.46247	1.00000
2014-02-05/12:20:01	6	12602.9	52.0000
2014-02-05/19:16:19	6	18.2440	72.0000
2014-02-06/08:37:58	4	5.30000	216.000
2014-02-06/09:00:23	5	5.30000	92.0000
2014-02-06/13:31:37	1	8896.90	136.000
2014-02-06/14:58:02	2	7.40000	232.000
2014-02-06/15:23:38	3	7.40000	57.0000
2014-02-06/15:39:38	4	9.50000	1107.00
2014-02-06/15:58:50	5	7.40000	246.000
2014-02-06/16:11:38	6	544.300	282.000
2014-02-06/22:01:14	2	5.30000	43.0000
2014-02-06/23:14:50	6	601.000	106.000
2014-02-07/03:32:18	1	9.16646	27.0000
2014-02-07/06:17:02	5	5270.30	114.000
2014-02-07/13:16:52	6	15005.6	78.0000
2014-02-07/17:32:38	1	1009.00	453.000
2014-02-07/18:55:51	2	5.30000	140.000
2014-02-07/19:11:51	3	9.50000	293.000
2014-02-07/19:34:15	4	11.6000	3902.00
2014-02-07/19:53:27	5	11.6000	423.000
2014-02-08/14:46:48	1	23.8000	91.0000
2014-02-08/15:50:48	2	5.30000	92.0000
2014-02-08/16:10:01	3	5.30000	43.0000
2014-02-08/16:35:37	4	7.40000	114.000
2014-02-08/16:51:37	5	9.50000	77.0000
2014-02-08/17:04:25	6	159.000	97.0000
2014-02-08/23:54:21	5	7.40000	114.000
2014-02-09/05:51:52	2	9.50000	72.0000
2014-02-09/06:04:40	3	11.6000	44.0000
2014-02-09/06:27:04	4	9.50000	1811.00
2014-02-09/06:46:16	5	9.50000	113.000
2014-02-09/06:59:04	6	9.50000	84.0000
2014-02-09/12:49:15	2	5.30000	70.0000
2014-02-09/13:14:51	3	7.40000	26.0000
2014-02-09/13:30:51	4	7.40000	192.000
2014-02-09/13:50:04	5	7.40000	53.0000
2014-02-09/18:44:46	1	15005.6	92.0000
2014-02-09/20:46:23	5	5.30000	202.000
2014-02-10/02:52:48	2	9.50000	31.0000
2014-02-10/02:59:12	3	7.40000	26.0000
2014-02-10/03:47:12	5	15.8000	68.0000
2014-02-10/04:00:00	6	36.8000	59.0000
2014-02-10/09:06:22	1	4.97160	16.0000
2014-02-10/10:31:02	4	21.2592	131.000
2014-02-10/10:40:00	5	14.5038	144.000
2014-02-10/10:57:01	6	28.8668	256.000
2014-02-10/17:31:51	4	9.50000	340.000
2014-02-10/17:47:51	5	9.50000	308.000

2014-02-10/17:54:15	6	11.6000	119.000
2014-02-11/15:03:57	6	5.36673	13.0000
2014-02-11/21:48:34	5	13.7000	97.0000
2014-02-11/22:04:34	6	33.7000	69.0000
2014-02-12/02:24:20	1	73.9000	101.000
2014-02-12/04:22:45	4	3.20000	35.0000
2014-02-12/04:45:09	5	3.20000	111.000
2014-02-12/05:01:09	6	3.20000	111.000
2014-02-12/18:24:12	3	11.6000	1188.00
2014-02-12/18:42:00	4	57.4536	420.000
2014-02-12/18:58:37	5	84.2137	61.0000
2014-02-13/08:20:39	4	7.40000	1090.00
2014-02-13/08:36:40	5	7.40000	137.000
2014-02-13/14:41:31	2	13.7000	656.000
2014-02-13/15:13:31	4	3.20000	34.0000
2014-02-13/15:35:55	5	5.30000	165.000
2014-02-13/15:58:19	6	56.9000	218.000
2014-02-14/03:20:23	1	43.8000	102.000
2014-02-14/04:30:47	2	13.7000	224.000
2014-02-14/04:53:11	3	9.50000	53.0000
2014-02-14/05:05:59	4	9.50000	120.000
2014-02-14/05:28:24	5	9.50000	1222.00
2014-02-14/05:47:36	6	13.7000	153.000
2014-02-14/17:41:24	1	15005.6	90.0000
2014-02-14/18:29:24	2	113.700	81.0000
2014-02-14/19:49:25	5	15005.6	78.0000
2014-02-15/02:35:39	5	31.1610	108.000
2014-02-15/02:54:41	6	24.7727	49.0000
2014-02-15/15:37:22	2	5.30000	85.0000
2014-02-15/15:50:11	3	7.40000	38.0000
2014-02-15/16:28:35	5	9.50000	134.000
2014-02-15/23:31:18	5	11.6000	203.000
2014-02-16/11:25:37	1	544.300	268.000
2014-02-16/13:11:14	4	5.30000	48.0000
2014-02-16/13:27:14	5	11.6000	157.000
2014-02-16/13:41:41	6	309.034	19.0000
2014-02-16/18:39:36	1	36.3110	41.0000
2014-02-16/19:31:49	2	36.8000	318.000
2014-02-16/19:45:20	3	9.89498	2.00000
2014-02-16/20:26:14	5	43.8000	116.000
2014-02-16/20:42:14	6	113.700	360.000
2014-02-17/09:43:01	3	9.50000	6499.00
2014-02-17/10:05:26	4	5.30000	52.0000
2014-02-17/10:24:38	5	7.40000	561.000
2014-02-17/10:43:50	6	47.8000	99.0000
2014-02-17/15:33:40	1	72.2698	342.000
2014-02-17/17:39:38	6	49.3050	282.000
2014-02-18/00:13:28	4	9.50000	10172.0
2014-02-18/00:29:28	5	11.6000	276.000
2014-02-18/00:42:40	6	419.623	125.000
2014-02-18/05:28:27	1	6845.60	122.000
2014-02-18/07:10:52	4	5.30000	73.0000
2014-02-18/07:23:40	5	11.6000	274.000

2014-02-18/07:36:28	6	15005.6	111.000
2014-02-18/14:08:42	4	3.20000	46.0000
2014-02-18/14:17:38	5	26.7415	125.000
2014-02-18/20:27:41	2	7.40000	85.0000
2014-02-18/20:46:53	3	9.50000	117.000
2014-02-18/21:09:18	4	9.50000	443.000
2014-02-18/21:25:18	5	9.50000	659.000
2014-02-19/03:27:13	2	9.50000	122.000
2014-02-19/03:38:38	3	57.4536	9.00000
2014-02-19/03:59:56	4	45.6749	15.0000
2014-02-19/04:22:02	5	45.6749	51.0000
2014-02-19/04:35:58	6	53.2236	249.000
2014-02-19/11:40:37	6	11.5303	53.0000
2014-02-19/18:21:40	5	36.8000	132.000
2014-02-19/18:34:28	6	272.300	79.0000
2014-02-19/23:24:55	1	15005.6	49.0000
2014-02-20/00:09:43	2	15.8000	180.000
2014-02-20/00:28:55	3	11.6000	155.000
2014-02-20/00:57:44	4	9.50000	143.000
2014-02-20/01:23:20	5	9.50000	46.0000
2014-02-20/01:36:08	6	15005.6	48.0000
2014-02-20/07:34:35	3	11.6000	108.000
2014-02-20/07:56:59	4	7.40000	32.0000
2014-02-20/08:19:23	5	7.40000	27.0000
2014-02-20/14:24:30	2	3.20000	90.0000
2014-02-20/14:50:07	3	3.20000	35.0000
2014-02-20/15:03:23	4	195.311	0.00000
2014-02-20/15:17:19	5	167.611	4.00000
2014-02-20/15:32:59	6	167.611	133.000
2014-02-20/21:27:16	2	9.50000	133.000
2014-02-20/21:43:16	3	9.50000	60.0000
2014-02-20/22:05:40	4	9.50000	46.0000
2014-02-20/22:21:40	5	13.7000	1841.00
2014-02-20/22:31:16	6	26.0000	50.0000
2014-02-21/03:19:35	1	11.6000	116.000
2014-02-21/04:20:23	2	3.20000	81.0000
2014-02-21/05:18:00	5	5.30000	134.000
2014-02-21/05:30:48	6	11.6000	135.000
2014-02-21/10:19:49	1	80.6000	81.0000
2014-02-21/11:20:38	2	9.50000	154.000
2014-02-21/11:49:26	3	9.50000	67.0000
2014-02-21/11:55:50	4	9.50000	702.000
2014-02-21/12:09:42	5	16.9008	167.000
2014-02-21/12:33:21	6	14.5038	48.0000
2014-02-21/18:16:10	2	9.50000	166.000
2014-02-21/19:13:46	5	7.40000	171.000
2014-02-21/19:29:46	6	15005.6	151.000
2014-02-22/01:30:40	2	13.7000	674.000
2014-02-22/01:43:28	3	9.50000	77.0000
2014-02-22/02:02:40	4	11.6000	27420.0
2014-02-22/02:21:52	5	11.6000	325.000
2014-02-22/09:20:21	5	488.974	0.00000
2014-02-22/23:01:41	4	5.30000	56.0000

2014-02-22/23:14:29	5	7.40000	55.0000
2014-02-23/05:08:24	2	1.00000	73.0000
2014-02-23/05:18:03	3	36.3110	5.00000
2014-02-23/05:51:41	4	2.91075	0.00000
2014-02-23/06:12:19	5	2.14364	1.00000
2014-02-23/06:23:58	6	2.49792	8.00000
2014-02-23/13:03:40	5	15.8000	75.0000
2014-02-23/13:22:52	6	62.1000	60.0000
2014-02-23/18:30:38	1	36.8000	107.000
2014-02-23/19:15:27	2	9.50000	128.000
2014-02-23/19:28:40	3	26.7415	9.00000
2014-02-23/19:43:21	4	16.9008	13.0000
2014-02-23/20:08:20	5	12.4467	49.0000
2014-02-23/20:23:20	6	19.6940	103.000
2014-02-24/02:57:20	4	3.20000	46.0000
2014-02-24/03:13:20	5	3.20000	82.0000
2014-02-24/03:26:08	6	3.20000	65.0000
2014-02-24/09:26:59	3	11.6000	396.000
2014-02-24/10:15:00	5	47.8000	135.000
2014-02-24/16:16:55	2	20.0000	10827.0
2014-02-24/16:52:07	4	7.40000	53.0000
2014-02-24/17:08:07	5	7.40000	192.000
2014-02-24/23:10:14	2	11.6000	149.000
2014-02-24/23:32:38	3	9.50000	104.000
2014-02-25/00:11:02	5	11.6000	13591.0
2014-02-25/05:05:29	1	36.8000	135.000
2014-02-25/06:54:18	4	9.50000	1581.00
2014-02-25/07:13:30	5	9.50000	1685.00
2014-02-25/13:18:20	2	7.40000	62.0000
2014-02-25/13:40:44	3	9.50000	173.000
2014-02-25/13:50:20	4	7.40000	139.000
2014-02-25/14:06:20	5	9.50000	1030.00
2014-02-25/19:06:41	1	7.28723	10.0000
2014-02-25/20:11:27	2	11.6000	435.000
2014-02-25/20:49:51	4	11.6000	17841.0
2014-02-25/21:26:58	6	16.9008	27.0000
2014-02-26/02:10:18	1	1.17376	1.00000
2014-02-26/03:11:52	2	125.000	118.000
2014-02-26/03:40:40	3	40.1000	98.0000
2014-02-26/03:53:28	4	33.7000	106.000
2014-02-26/04:09:28	5	47.8000	221.000
2014-02-26/04:22:17	6	62.1000	142.000
2014-02-26/10:48:44	4	9.50000	189.000
2014-02-26/11:11:08	5	11.6000	195.000
2014-02-26/18:00:06	5	3.20000	150.000
2014-02-26/18:22:30	6	9.50000	223.000
2014-02-27/00:25:13	3	3.20000	123.000
2014-02-27/01:06:50	5	7.40000	135.000
2014-02-27/07:02:05	2	11.6000	381.000
2014-02-27/07:24:29	3	9.50000	155.000
2014-02-27/07:46:53	4	9.50000	166.000
2014-02-27/08:06:05	5	15.8000	4505.00
2014-02-27/15:02:41	4	5.30000	197.000

2014-02-28/18:37:59	4	9.50000	635.000
2014-02-28/18:57:11	5	9.50000	329.000
2014-02-28/19:10:00	6	9.50000	327.000
2014-03-01/01:54:04	4	7.40000	131.000
2014-03-01/02:06:52	5	26.0000	171.000
2014-03-01/06:54:40	1	78.0135	390.000
2014-03-01/08:57:04	5	36.8000	232.000
2014-03-01/09:13:05	6	80.6000	109.000
2014-03-01/22:00:39	2	9.50000	199.000
2014-03-01/22:35:51	4	3.20000	47.0000
2014-03-01/22:55:04	5	5.30000	215.000
2014-03-01/23:08:58	6	309.034	128.000
2014-03-02/06:00:38	3	15.8000	117.000
2014-03-02/10:57:38	1	7.86639	7.00000
2014-03-02/12:37:46	4	7.40000	67.0000
2014-03-02/12:53:46	5	9.50000	670.000
2014-03-02/18:07:40	1	227.000	180.000
2014-03-02/19:37:17	4	11.6000	6522.00
2014-03-02/19:53:17	5	11.6000	1509.00
2014-03-03/02:32:46	4	9.50000	290.000
2014-03-03/02:45:34	5	9.50000	8167.00
2014-03-03/03:01:34	6	102.300	118.000
2014-03-03/08:05:20	1	9.16646	38.0000
2014-03-03/09:52:02	5	7.40000	58.0000
2014-03-03/15:12:20	1	419.700	221.000
2014-03-04/06:50:14	5	15.8000	4272.00
2014-03-04/06:59:50	6	30.9000	78.0000
2014-03-04/12:57:00	4	3.20000	57.0000
2014-03-04/13:45:00	5	11.6000	24009.0
2014-03-04/14:01:00	6	15.8000	84.0000
2014-03-05/02:00:23	1	11.5303	38.0000
2014-03-05/02:54:38	2	419.623	1.00000
2014-03-05/03:33:41	4	90.9067	0.00000
2014-03-05/03:45:41	5	78.0135	39.0000
2014-03-05/03:57:20	6	62.0198	330.000
2014-03-05/09:57:00	2	11.6000	1363.00
2014-03-05/10:09:48	3	11.6000	2338.00
2014-03-05/10:35:24	4	11.6000	2466.00
2014-03-05/10:48:12	5	13.7000	2982.00
2014-03-05/10:57:48	6	36.8000	140.000
2014-03-05/17:06:59	3	265.204	5.00000
2014-03-05/17:18:59	4	265.204	3.00000
2014-03-05/17:42:18	5	210.834	4.00000
2014-03-05/17:57:58	6	227.590	376.000
2014-03-05/22:48:55	1	1201.70	389.000
2014-03-06/14:29:52	4	7.40000	446.000
2014-03-06/14:45:52	5	7.40000	134.000
2014-03-06/20:50:50	2	11.6000	1459.00
2014-03-06/21:26:02	4	9.50000	2284.00
2014-03-06/21:38:50	5	11.6000	9409.00
2014-03-06/21:51:38	6	33.7000	96.0000
2014-03-07/03:05:49	1	102.300	129.000
2014-03-07/04:41:50	5	13.7000	313.000

2014-03-07/17:50:20	2	5.30000	50.0000
2014-03-07/17:59:56	3	5.30000	42.0000
2014-03-07/18:35:08	5	26.0000	553.000
2014-03-07/18:51:08	6	40.1000	97.0000
2014-03-08/13:59:00	1	24.7727	61.0000
2014-03-08/14:47:51	2	3.20000	36.0000
2014-03-08/15:03:51	3	5.30000	47.0000
2014-03-08/15:26:15	4	7.40000	500.000
2014-03-08/15:51:52	5	13.7000	155.000
2014-03-10/07:38:03	1	6279.00	84.0000
2014-03-10/09:20:28	4	5.30000	68.0000
2014-03-10/09:30:04	5	5.30000	85.0000
2014-03-10/09:52:19	6	57.4536	218.000
2014-03-10/14:33:59	1	10.6814	25.0000
2014-03-10/15:40:32	2	43.8000	131.000
2014-03-10/16:38:08	5	17.9000	2998.00
2014-03-10/16:50:56	6	43.8000	162.000
2014-03-10/23:18:30	4	5.30000	67.0000
2014-03-10/23:34:30	5	5.30000	75.0000
2014-03-10/23:50:30	6	40.1000	82.0000
2014-03-11/06:21:14	4	7.40000	897.000
2014-03-11/18:44:43	1	49.3050	210.000
2014-03-11/20:16:18	4	11.6000	5315.00
2014-03-11/20:35:30	5	13.7000	6058.00
2014-03-12/01:49:40	1	9.50000	40.0000
2014-03-12/02:37:41	2	1.00000	30.0000
2014-03-12/03:03:17	3	1.00000	33.0000
2014-03-12/03:12:53	4	1.00000	28.0000
2014-03-12/03:35:17	5	1.00000	78.0000
2014-03-13/00:12:12	4	9.50000	3703.00
2014-03-13/00:31:24	5	13.7000	163.000
2014-03-13/05:44:15	1	20.0000	64.0000
2014-03-13/06:35:27	2	21.8000	89.0000
2014-03-13/07:29:52	5	5.30000	66.0000
2014-03-13/12:46:59	1	3.20000	131.000
2014-03-13/14:13:23	4	3.20000	85.0000
2014-03-13/14:29:23	5	5.30000	133.000
2014-03-13/14:40:03	6	57.4536	404.000
2014-03-15/13:34:29	1	2629.70	108.000
2014-03-15/14:25:42	2	5.30000	64.0000
2014-03-15/15:26:30	5	3.20000	75.0000
2014-03-16/03:32:44	1	13.4359	53.0000
2014-03-16/04:50:06	3	5.30000	41.0000
2014-03-16/05:02:54	4	5.30000	42.0000
2014-03-16/05:18:54	5	9.50000	95.0000
2014-03-16/05:34:54	6	3411.70	106.000
2014-03-16/10:31:58	1	15.6565	77.0000
2014-03-16/11:26:09	2	1700.30	112.000
2014-03-16/11:42:10	3	1303.70	25.0000
2014-03-16/12:07:46	4	1428.30	134.000
2014-03-16/12:23:46	5	1553.00	89.0000
2014-03-16/17:37:41	1	499.000	2058.00
2014-03-16/18:44:53	3	11.6000	1704.00

2014-03-16/18:57:41	4	11.6000	585.000
2014-03-17/08:25:32	2	7.40000	48.0000
2014-03-17/08:41:32	3	9.50000	217.000
2014-03-17/09:03:56	4	11.6000	76059.0
2014-03-17/09:16:44	5	13.7000	1639.00
2014-03-17/14:37:19	1	11.5303	34.0000
2014-03-17/15:41:38	3	78.0135	127.000
2014-03-17/15:56:58	4	66.9489	679.000
2014-03-17/16:16:43	5	53.2236	165.000
2014-03-17/16:26:58	6	45.6749	652.000
2014-03-17/22:18:36	2	13.7000	5546.00
2014-03-17/22:57:00	4	23.8000	2069.00
2014-03-17/23:09:48	5	30.9000	235.000
2014-03-17/23:25:48	6	47.8000	60.0000
2014-03-18/04:33:39	1	72.2698	29.0000
2014-03-18/06:14:08	5	13.7000	278.000
2014-03-18/06:33:20	6	40.1000	193.000
2014-03-18/12:17:00	2	7.40000	60.0000
2014-03-18/12:33:00	3	7.40000	43.0000
2014-03-18/13:08:12	5	125.000	82.0000
2014-03-18/13:30:36	6	385.700	118.000
2014-03-18/18:22:41	1	1.70417	11.0000
2014-03-18/19:53:35	4	20.0000	4837.00
2014-03-18/20:16:00	5	26.0000	90.0000
2014-03-18/20:25:36	6	40.1000	86.0000
2014-03-19/01:33:06	1	13.7000	60.0000
2014-03-19/02:33:55	2	15.8000	5464.00
2014-03-19/02:46:59	3	57.4536	16.0000
2014-03-19/03:09:07	5	147.700	41.0000
2014-03-19/09:20:38	2	15.8000	11278.0
2014-03-19/09:39:51	3	13.7000	1494.00
2014-03-19/09:55:51	4	17.9000	11790.0
2014-03-19/10:15:03	5	26.0000	178.000
2014-03-19/17:18:00	5	193.000	82.0000
2014-03-19/23:51:24	4	11.6000	7959.00
2014-03-20/00:17:00	5	9.50000	869.000
2014-03-20/05:18:06	1	56.9000	49.0000
2014-03-20/06:18:55	2	9.50000	285.000
2014-03-20/06:28:31	3	9.50000	69.0000
2014-03-20/06:54:07	4	11.6000	5762.00
2014-03-20/07:10:07	5	11.6000	3873.00
2014-03-20/14:19:15	5	113.700	125.000
2014-03-20/21:14:58	4	3.20000	74.0000
2014-03-21/02:25:21	1	84.2137	26.0000
2014-03-21/03:17:25	2	227.000	38.0000
2014-03-21/03:39:49	3	113.700	30.0000
2014-03-21/03:52:38	4	125.000	63.0000
2014-03-21/04:08:38	5	159.000	166.000
2014-03-21/16:29:19	1	8.49158	4.00000
2014-03-21/18:10:45	5	3.20000	101.000
2014-03-22/13:27:41	1	714.300	201.000
2014-03-22/14:12:30	2	73.9000	72.0000
2014-03-22/15:00:30	5	1.00000	123.000

2014-03-22/15:16:30	6	3.20000	135.000
2014-03-22/22:02:10	4	5.30000	145.000
2014-03-22/22:18:10	5	5.30000	155.000
2014-03-23/18:00:20	2	5.30000	114.000
2014-03-23/19:01:08	5	3.20000	95.0000
2014-03-23/19:17:08	6	5.30000	107.000
2014-03-24/00:14:15	1	1700.30	66.0000
2014-03-24/01:08:39	2	17.9000	348.000
2014-03-24/01:21:27	3	15.8000	255.000
2014-03-24/01:40:40	4	15.8000	1309.00
2014-03-24/02:03:04	5	17.9000	105.000
2014-03-24/02:15:52	6	20.0000	83.0000
2014-03-24/07:20:10	1	159.000	78.0000
2014-03-24/07:55:23	2	33.7000	115.000
2014-03-24/08:17:47	3	20.0000	104.000
2014-03-24/08:40:11	4	20.0000	2710.00
2014-03-24/08:56:11	5	23.8000	100.000
2014-03-24/09:15:23	6	33.7000	124.000
2014-03-24/14:22:54	1	6845.60	150.000
2014-03-24/15:58:55	4	21.8000	251.000
2014-03-24/16:13:39	5	3308.37	0.00000
2014-03-25/18:18:20	1	615.070	0.00000
2014-03-25/19:42:00	4	5.79326	7.00000
2014-03-25/19:57:00	5	4.97160	5.00000
2014-03-25/20:12:40	6	4.60557	5.00000
2014-03-26/01:09:03	1	2.14364	3.00000
2014-03-26/02:37:02	4	23.8000	3034.00
2014-03-26/02:56:14	5	30.9000	1223.00
2014-03-26/03:12:14	6	56.9000	192.000
2014-03-26/15:59:16	2	1.00000	98.0000
2014-03-26/16:21:40	3	1.00000	43.0000
2014-03-26/16:31:16	4	3.20000	47.0000
2014-03-26/16:44:04	5	3.20000	130.000
2014-03-26/23:13:11	2	13.7000	9395.00
2014-03-26/23:19:35	3	9.50000	310.000
2014-03-26/23:42:00	4	11.6000	29356.0
2014-03-26/23:54:48	5	11.6000	168.000
2014-03-27/06:51:46	5	13.7000	92.0000
2014-03-27/12:17:41	1	113.700	107.000
2014-03-27/14:07:41	6	1.35479	1.00000
2014-03-27/20:56:58	5	15.8000	4022.00
2014-03-27/21:06:34	6	20.0000	80.0000
2014-03-28/02:10:05	1	1099.70	593.000
2014-03-28/03:30:06	4	3.20000	37.0000
2014-03-28/03:52:30	5	5.30000	150.000
2014-03-28/04:03:18	6	105.931	29.0000
2014-03-28/10:12:13	3	17.9000	467.000
2014-03-28/10:31:26	4	15.8000	18955.0
2014-03-28/10:44:14	5	20.0000	1073.00
2014-03-28/11:03:26	6	95.9000	135.000
2014-03-28/16:56:49	2	11.6000	285.000
2014-03-28/17:12:49	3	11.6000	43.0000
2014-03-28/17:28:49	4	9.50000	50.0000

2014-03-28/17:41:37	5	13.7000	2380.00
2014-03-28/17:58:38	6	5.79326	12.0000
2014-03-28/23:56:22	2	13.7000	5543.00
2014-03-29/00:12:22	3	13.7000	1063.00
2014-03-29/00:34:46	4	17.9000	5397.00
2014-03-29/00:50:46	5	15.8000	84.0000
2014-03-29/06:07:21	1	388.728	9.00000
2014-03-29/06:55:37	2	80.6000	130.000
2014-03-29/07:47:40	5	114.350	8.00000
2014-03-29/07:59:39	6	114.350	316.000
2014-03-29/13:05:40	1	105.931	15.0000
2014-03-29/13:58:21	2	9.50000	140.000
2014-03-29/14:20:45	3	11.6000	661.000
2014-03-29/14:49:33	5	95.9000	94.0000
2014-03-29/20:11:42	1	8.49158	34.0000
2014-03-29/21:04:17	2	9.50000	143.000
2014-03-29/21:49:05	5	23.8000	2142.00
2014-03-30/03:11:43	1	12602.9	82.0000
2014-03-30/03:56:32	2	33.7000	126.000
2014-03-30/04:44:32	5	13.7000	203.000
2014-03-30/04:54:08	6	52.1000	74.0000
2014-03-30/10:05:38	1	227.590	15.0000
2014-03-30/11:35:00	5	26.0000	3693.00
2014-03-30/11:57:24	6	113.700	102.000
2014-03-30/17:01:43	1	181.700	73.0000
2014-03-30/17:43:19	2	36.8000	57.0000
2014-03-30/18:05:43	3	33.7000	42.0000
2014-03-30/18:28:07	4	26.0000	3684.00
2014-03-30/18:40:55	5	33.7000	94.0000
2014-03-30/18:56:55	6	43.8000	95.0000
2014-03-30/23:54:50	1	80.6000	117.000
2014-03-31/01:30:51	3	20.0000	8652.00
2014-03-31/01:46:51	4	28.3000	409.000
2014-03-31/02:02:51	5	1201.70	555.000
2014-03-31/13:56:38	1	8.49158	16.0000
2014-03-31/14:38:12	2	1201.70	75.0000
2014-03-31/21:02:31	1	4839.60	65.0000
2014-03-31/21:56:56	2	87.9000	32.0000
2014-03-31/22:14:41	3	24.7727	10.0000
2014-03-31/22:39:20	5	3.39180	2.00000
2014-03-31/22:54:00	6	14.5038	37.0000
2014-04-01/04:01:58	1	167.611	78.0000
2014-04-01/04:49:47	2	11.6000	108.000
2014-04-01/05:04:40	3	360.108	3.00000
2014-04-01/05:20:41	4	388.728	3.00000
2014-04-01/05:34:01	5	419.623	1.00000
2014-04-01/11:57:17	2	452.973	3.00000
2014-04-01/12:21:40	3	2090.91	0.00000
2014-04-01/12:36:40	4	1662.25	0.00000
2014-04-01/12:53:01	5	1426.49	0.00000
2014-04-01/18:48:49	2	15.8000	6458.00
2014-04-01/19:40:02	5	125.000	96.0000
2014-04-01/19:52:50	6	15005.6	73.0000

2014-04-02/02:42:45	5	15005.6	60.0000
2014-04-02/02:55:22	6	1.57870	2.00000
2014-04-02/07:56:58	1	5.36673	5.00000
2014-04-02/08:34:48	2	43.8000	66.0000
2014-04-02/16:19:22	3	9.50000	41.0000
2014-04-02/16:38:34	4	13.7000	85.0000
2014-04-02/16:54:34	5	2867.70	148.000
2014-04-02/23:51:58	6	488.974	24.0000
2014-04-03/11:57:24	1	181.700	61.0000
2014-04-03/13:14:13	4	11.6000	136.000
2014-04-03/13:33:25	5	17.9000	122.000
2014-04-03/13:46:13	6	26.0000	89.0000
2014-04-03/18:51:16	1	452.973	12.0000
2014-04-03/20:31:40	5	42.3121	137.000
2014-04-03/20:47:20	6	62.0198	49.0000
2014-04-04/01:55:18	1	227.590	39.0000
2014-04-04/02:41:09	2	13.7000	780.000
2014-04-04/03:00:21	3	17.9000	36.0000
2014-04-04/03:19:34	4	15.8000	139.000
2014-04-04/03:35:34	5	17.9000	94.0000
2014-04-04/03:45:10	6	26.0000	78.0000
2014-04-04/09:56:41	3	5.30000	22.0000
2014-04-04/10:31:53	5	17.9000	2313.00
2014-04-04/15:55:08	1	36.8000	56.0000
2014-04-04/17:15:09	4	3.20000	35.0000
2014-04-04/17:27:57	5	3.20000	80.0000
2014-04-05/19:58:40	1	2.69644	0.00000
2014-04-05/21:14:12	4	13.7000	9867.00
2014-04-05/21:23:48	5	17.9000	3784.00
2014-04-05/21:39:20	6	12.4467	27.0000
2014-04-06/02:55:20	1	28.8668	139.000
2014-04-06/04:31:36	5	544.300	55.0000
2014-04-06/04:41:12	6	2867.70	73.0000
2014-04-06/09:53:40	1	90.9067	116.000
2014-04-06/10:43:07	2	15.8000	1819.00
2014-04-06/10:53:57	3	123.438	1.00000
2014-04-06/11:13:59	4	123.438	2.00000
2014-04-06/11:25:58	5	133.248	11.0000
2014-04-06/11:40:18	6	180.932	25.0000
2014-04-06/16:50:20	1	210.834	16.0000
2014-04-06/17:42:38	2	21.8000	1292.00
2014-04-06/18:21:03	5	419.700	81.0000
2014-04-06/23:51:38	1	1.17376	1.00000
2014-04-07/01:35:39	6	569.786	42.0000
2014-04-07/08:10:21	4	210.834	4.00000
2014-04-07/08:22:20	5	210.834	4.00000
2014-04-07/08:36:40	6	180.932	127.000
2014-04-07/13:49:59	1	133.248	35.0000
2014-04-07/15:15:57	5	13.7000	2062.00
2014-04-07/15:31:57	6	73.9000	80.0000
2014-04-07/21:03:58	1	5.79326	12.0000
2014-04-08/05:20:38	3	57.4536	377.000
2014-04-08/10:43:23	1	53.2236	278.000

2014-04-08/12:11:19	5	26.0000	916.000
2014-04-08/12:39:00	6	14.5038	36.0000
2014-04-08/19:03:16	4	33.7000	109.000
2014-04-08/19:19:16	5	47.8000	102.000
2014-04-08/19:38:28	6	87.9000	98.0000
2014-04-09/02:16:16	5	265.204	13.0000
2014-04-09/02:43:00	6	309.034	15.0000
2014-04-09/09:58:36	6	21.2592	29.0000
2014-04-09/16:02:20	4	98.1317	1.00000
2014-04-09/16:16:36	5	90.9067	11.0000
2014-04-09/16:51:41	6	84.2137	112.000
2014-04-09/23:31:00	6	2436.47	0.00000
2014-04-10/04:36:57	1	155.270	7.00000
2014-04-10/06:29:40	6	333.595	20.0000
2014-04-10/12:38:43	3	15.8000	686.000
2014-04-10/13:01:37	4	57.4536	21.0000
2014-04-10/13:10:19	5	90.9067	4.00000
2014-04-10/13:28:20	6	84.2137	1825.00
2014-04-10/18:41:19	1	265.204	1.00000
2014-04-10/20:06:59	5	123.438	1.00000
2014-04-10/20:25:56	6	105.931	24.0000
2014-04-11/02:27:51	2	13.7000	561.000
2014-04-11/03:07:39	5	90.9067	8.00000
2014-04-11/03:23:15	6	66.9489	774.000
2014-04-11/09:27:23	2	15.8000	7296.00
2014-04-11/10:26:41	6	72.2698	21.0000
2014-04-11/16:23:27	2	17.9000	414.000
2014-04-11/16:42:39	3	17.9000	484.000
2014-04-11/16:58:21	4	2839.15	0.00000
2014-04-11/17:10:21	5	2090.91	0.00000
2014-04-12/13:25:22	2	15.8000	14584.0
2014-04-12/13:38:10	3	13.7000	7325.00
2014-04-12/13:54:10	4	15.8000	23965.0
2014-04-12/14:16:34	5	13.7000	59.0000
2014-04-12/20:39:52	3	26.0000	67.0000
2014-04-12/20:55:52	4	26.0000	88.0000
2014-04-12/21:11:52	5	20.0000	212.000
2014-04-13/02:26:20	1	31.1610	39.0000
2014-04-13/03:20:59	2	3717.60	43.0000
2014-04-13/03:36:59	3	2210.30	40.0000
2014-04-13/03:56:12	4	2403.00	48.0000
2014-04-13/04:15:24	5	4057.60	70.0000
2014-04-13/04:31:24	6	11548.9	58.0000
2014-04-13/09:39:40	1	8.49158	6.00000
2014-04-14/01:16:19	6	2090.91	0.00000
2014-04-14/06:16:21	1	167.611	56.0000
2014-04-14/07:18:51	2	17.9000	95.0000
2014-04-14/07:31:39	3	15.8000	526.000
2014-04-14/07:44:28	4	17.9000	122.000
2014-04-14/08:28:39	6	155.270	909.000
2014-04-14/13:22:59	1	42.3121	71.0000
2014-04-14/14:05:35	2	3411.70	50.0000
2014-04-14/14:27:59	3	1201.70	28.0000

2014-04-14/15:06:23	5	4839.60	38.0000
2014-04-14/15:23:18	6	333.595	85.0000
2014-04-14/20:27:27	1	15005.6	72.0000
2014-04-14/21:56:59	5	31.1610	114.000
2014-04-14/22:21:18	6	72.2698	35.0000
2014-04-15/03:35:16	1	18.2440	59.0000
2014-04-15/04:46:12	4	28.3000	21.0000
2014-04-15/04:59:00	5	33.7000	78.0000
2014-04-15/05:18:12	6	43.8000	49.0000
2014-04-15/10:28:18	1	10.6814	14.0000
2014-04-15/11:13:27	2	6279.00	97.0000
2014-04-15/12:02:00	5	1.17376	4.00000
2014-04-15/12:17:37	6	2.14364	18.0000
2014-04-16/00:34:40	1	4.97160	10.0000
2014-04-16/01:14:59	2	8282.70	0.00000
2014-04-16/01:30:00	3	4849.31	2.00000
2014-04-16/01:42:39	4	5234.71	1.00000
2014-04-16/01:55:39	5	5650.75	0.00000
2014-04-16/02:25:19	6	14147.0	0.00000
2014-04-16/07:21:00	1	773.685	3.00000
2014-04-16/08:02:19	2	133.248	3.00000
2014-04-16/09:16:24	6	7672.88	0.00000
2014-04-16/14:27:19	1	90.9067	165.000
2014-04-16/15:11:44	2	1.70417	2.00000
2014-04-16/16:16:02	6	210.834	34.0000
2014-04-16/21:32:20	1	22.9488	123.000
2014-04-16/22:07:39	2	13.7000	761.000
2014-04-16/22:23:39	3	11.6000	592.000
2014-04-16/22:42:52	4	11.6000	5825.00
2014-04-16/22:55:40	5	15.8000	80.0000
2014-04-16/23:13:41	6	78.0135	76.0000
2014-04-18/03:15:41	6	488.974	2.00000
2014-04-18/09:17:47	2	15.8000	14903.0
2014-04-18/09:56:11	5	30.9000	705.000
2014-04-18/10:12:40	6	4.26649	10.0000
2014-04-18/16:55:43	5	40.1000	98.0000
2014-04-18/17:14:55	6	159.000	46.0000
2014-04-18/23:37:02	4	33.7000	60.0000
2014-04-18/23:46:38	5	40.1000	122.000
2014-04-19/00:12:14	6	159.000	117.000
2014-04-19/05:31:01	1	18.2440	73.0000
2014-04-19/06:51:30	5	15.8000	117.000
2014-04-19/07:07:30	6	36.8000	79.0000
2014-04-19/12:31:17	1	42.3121	101.000
2014-04-19/13:06:13	2	7.40000	38.0000
2014-04-19/13:23:24	3	835.175	0.00000
2014-04-19/13:55:57	5	1.25505	4.00000
2014-04-19/14:09:21	6	1.98581	4.00000
2014-04-20/02:29:54	1	15005.6	74.0000
2014-04-20/04:08:18	6	15.6565	27.0000
2014-04-20/10:43:02	5	295.000	75.0000
2014-04-20/11:08:38	6	918.300	94.0000
2014-04-20/16:28:00	1	1.17376	1.00000

2014-04-20/17:39:05	4	80.6000	71.0000
2014-04-20/17:48:41	5	113.700	64.0000
2014-04-20/18:04:42	6	295.000	110.000
2014-04-20/23:05:23	1	15005.6	77.0000
2014-04-21/00:31:48	4	15.8000	5181.00
2014-04-21/00:44:36	5	15.8000	1350.00
2014-04-21/01:12:19	6	615.070	10.0000
2014-04-21/06:17:59	1	4057.60	402.000
2014-04-21/07:47:36	4	7.40000	75.0000
2014-04-21/08:02:20	5	309.034	120.000
2014-04-21/13:25:02	1	45.6749	380.000
2014-04-21/13:23:58	2	488.974	2.00000
2014-04-21/14:43:56	6	113.700	174.000
2014-04-21/15:00:41	7	1794.36	1.00000
2014-04-21/21:29:36	4	7.40000	22.0000
2014-04-21/21:42:24	5	11.6000	944.000
2014-04-21/22:01:36	6	73.9000	97.0000
2014-04-22/10:22:40	1	973.203	5.00000
2014-04-22/11:42:18	5	21.8000	1617.00
2014-04-22/11:57:59	6	123.438	273.000
2014-04-22/17:22:01	1	1.98581	3.00000
2014-04-22/18:40:08	5	1428.30	93.0000
2014-04-22/18:56:08	6	4839.60	751.000
2014-04-23/00:58:19	2	1539.86	0.00000
2014-04-23/01:15:40	3	388.728	0.00000
2014-04-23/01:37:18	5	2436.47	0.00000
2014-04-23/01:56:56	6	2257.09	0.00000
2014-04-23/08:40:47	6	5.30000	64.0000
2014-04-23/08:53:35	7	23.8000	67.0000
2014-04-23/14:20:38	1	62.0198	181.000
2014-04-23/15:53:50	6	6279.00	48.0000
2014-04-23/21:21:38	1	24.7727	55.0000
2014-04-23/22:04:33	2	1303.70	28.0000
2014-04-23/22:12:01	3	615.070	0.00000
2014-04-23/22:25:20	4	615.070	0.00000
2014-04-23/22:42:01	5	452.973	0.00000
2014-04-23/22:53:20	6	527.835	4.00000
2014-04-24/04:05:40	1	180.932	4.00000
2014-04-24/05:07:01	3	11.6000	176.000
2014-04-24/05:26:13	4	11.6000	869.000
2014-04-24/05:39:01	5	11.6000	116.000
2014-04-24/11:09:20	1	98.1317	238.000
2014-04-24/11:57:21	2	7.86639	8.00000
2014-04-24/18:58:20	2	26.7415	44.0000
2014-04-24/19:10:40	3	18.2440	5.00000
2014-04-24/19:24:40	4	28.8668	25.0000
2014-04-24/19:40:00	5	33.6376	75.0000
2014-04-25/01:16:20	1	21.2592	96.0000
2014-04-25/01:52:25	2	2403.00	55.0000
2014-04-25/02:05:13	3	2017.70	35.0000
2014-04-25/02:22:38	4	1224.17	0.00000
2014-04-25/02:49:02	6	210.834	3.00000
2014-04-25/08:15:18	1	9.89498	17.0000

2014-04-25/08:51:57	2	15005.6	67.0000
2014-04-25/09:07:57	3	15005.6	36.0000
2014-04-25/09:23:57	4	15005.6	31.0000
2014-04-25/09:34:40	5	33.6376	79.0000
2014-04-25/10:02:00	6	39.1969	36.0000
2014-04-25/15:17:00	1	19.6940	57.0000
2014-04-25/15:50:18	2	98.1317	7.00000
2014-04-25/16:11:40	3	84.2137	1.00000
2014-04-25/16:25:39	4	84.2137	2.00000
2014-04-25/16:36:58	5	98.1317	27.0000
2014-04-25/16:50:38	6	90.9067	1585.00
2014-04-25/22:03:42	1	31.1610	84.0000
2014-04-25/22:44:17	2	1.57870	0.00000
2014-04-25/22:59:17	3	1.46247	1.00000
2014-04-25/23:12:41	4	1.46247	0.00000
2014-04-25/23:27:01	5	1.83961	3.00000
2014-04-25/23:53:21	6	2.69644	2.00000
2014-04-26/06:06:31	3	9.50000	31.0000
2014-04-26/06:22:31	4	11.6000	491.000
2014-04-26/06:28:55	5	11.6000	102.000
2014-04-26/06:48:07	6	95.9000	82.0000
2014-04-26/12:17:46	1	15005.6	45.0000
2014-04-26/13:37:46	5	9.50000	73.0000
2014-04-26/19:47:47	2	11.6000	316.000
2014-04-26/20:06:59	3	13.7000	10738.0
2014-04-26/20:19:47	4	17.9000	10290.0
2014-04-26/20:35:47	5	26.0000	188.000
2014-04-26/20:51:41	6	143.838	39.0000
2014-04-27/02:04:01	1	39.1969	76.0000
2014-04-27/03:27:41	5	309.034	0.00000
2014-04-27/03:49:19	6	309.034	5.00000
2014-04-27/10:33:41	5	72.2698	122.000
2014-04-27/16:00:21	1	18.2440	44.0000
2014-04-27/17:49:20	6	2839.15	0.00000
2014-04-28/00:16:56	4	123.438	1.00000
2014-04-28/00:32:40	5	123.438	132.000
2014-04-28/00:50:01	6	98.1317	0.00000
2014-04-28/06:39:01	2	245.678	0.00000
2014-04-28/07:45:19	6	114.350	64.0000
2014-04-28/14:47:21	6	98.1317	441.000
2014-04-28/19:57:18	1	2.69644	1.00000
2014-04-28/20:42:23	2	193.000	90.0000
2014-04-28/21:47:21	6	49.3050	113.000
2014-04-29/02:57:20	1	62.0198	351.000
2014-04-29/03:52:36	3	9.16646	11.0000
2014-04-29/04:13:58	4	9.89498	8.00000
2014-04-29/04:27:01	5	9.89498	9.00000
2014-04-29/04:45:58	6	12.4467	16.0000
2014-04-29/09:57:56	1	66.9489	395.000
2014-04-29/11:22:29	5	295.000	78.0000
2014-04-29/11:44:53	6	1700.30	153.000
2014-04-29/17:00:08	1	4431.60	49.0000
2014-04-29/17:38:32	2	181.700	110.000

2014-04-29/17:54:32	3	193.000	29.0000
2014-04-29/18:29:45	5	7.40000	57.0000
2014-04-29/18:45:45	6	17.9000	73.0000
2014-04-29/23:58:20	1	42.3121	244.000
2014-04-30/00:33:18	2	9.16646	5.00000
2014-04-30/00:50:39	3	3.95237	4.00000
2014-04-30/01:43:42	6	28.8668	84.0000
2014-04-30/07:06:59	1	2.49792	1.00000
2014-04-30/07:33:51	2	1859.00	39.0000
2014-04-30/07:53:04	3	1553.00	34.0000
2014-04-30/08:09:04	4	1700.30	40.0000
2014-04-30/08:25:04	5	1553.00	64.0000
2014-04-30/08:44:16	6	2403.00	62.0000
2014-05-01/18:08:41	1	31.1610	205.000
2014-05-01/18:39:01	2	9.89498	21.0000
2014-05-01/19:36:01	6	53.2236	254.000
2014-05-02/01:10:39	1	21.2592	158.000
2014-05-02/01:38:39	2	1.17376	0.00000
2014-05-02/01:51:36	3	15005.6	29.0000
2014-05-02/02:38:20	6	123.438	13.0000
2014-05-02/07:58:41	1	42.3121	136.000
2014-05-02/08:44:28	2	15.8000	543.000
2014-05-02/08:50:52	3	17.9000	332.000
2014-05-02/09:06:40	4	2.31401	0.00000
2014-05-02/09:19:16	5	2.69644	4.00000
2014-05-02/09:30:39	6	3.39180	10.0000
2014-05-02/15:01:58	1	1.17376	4.00000
2014-05-02/15:32:26	2	9701.60	55.0000
2014-05-02/15:45:14	3	11548.9	46.0000
2014-05-02/15:58:02	4	9701.60	39.0000
2014-05-02/16:14:02	5	9701.60	49.0000
2014-05-02/16:33:14	6	15005.6	66.0000
2014-05-02/21:58:05	1	15005.6	57.0000
2014-05-02/22:33:18	2	15005.6	38.0000
2014-05-02/22:52:30	3	15005.6	30.0000
2014-05-02/23:11:42	4	15005.6	33.0000
2014-05-02/23:33:59	6	360.108	14.0000
2014-05-03/13:32:43	6	3717.60	68.0000
2014-05-03/18:51:02	1	15005.6	73.0000
2014-05-03/20:35:21	6	1.25505	0.00000
2014-05-04/15:42:39	1	4.60557	4.00000
2014-05-04/16:33:11	2	15.8000	4088.00
2014-05-04/16:45:59	3	9.50000	239.000
2014-05-04/17:05:11	4	9.50000	2810.00
2014-05-04/17:15:18	5	1426.49	0.00000
2014-05-04/17:31:19	6	716.723	1.00000
2014-05-04/22:49:21	1	9.16646	18.0000
2014-05-04/23:29:37	2	11.6000	924.000
2014-05-04/23:50:59	3	84.2137	3.00000
2014-05-05/00:34:03	6	1224.17	1.00000
2014-05-05/05:44:38	1	78.0135	59.0000
2014-05-05/07:15:40	5	133.248	3.00000
2014-05-05/07:28:43	6	123.438	10.0000

2014-05-05/12:58:40	1	62.0198	68.0000
2014-05-05/13:30:21	2	36.3110	22.0000
2014-05-05/13:45:21	3	28.8668	0.00000
2014-05-05/14:05:19	5	5.79326	3.00000
2014-05-05/19:53:20	1	180.932	43.0000
2014-05-05/21:10:39	5	544.300	659.000
2014-05-05/21:26:39	6	4057.60	55.0000
2014-05-06/02:49:00	1	1.70417	8.00000
2014-05-06/03:57:06	4	20.0000	435.000
2014-05-06/04:09:54	5	26.0000	131.000
2014-05-06/04:25:19	6	123.438	4.00000
2014-05-06/09:55:00	1	53.2236	185.000
2014-05-06/10:27:21	2	15.6565	9.00000
2014-05-06/10:42:41	3	11.5303	6.00000
2014-05-06/10:51:36	4	11.5303	2.00000
2014-05-06/11:06:20	5	9.89498	47.0000
2014-05-06/11:20:41	6	11.5303	106.000
2014-05-06/16:53:21	1	31.1610	575.000
2014-05-06/18:05:13	5	36.8000	66.0000
2014-05-06/23:50:52	1	136.300	52.0000
2014-05-07/01:04:28	5	7.40000	39.0000
2014-05-07/01:26:52	6	5757.60	46.0000
2014-05-07/06:41:59	1	1134.04	2.00000
2014-05-07/07:23:23	2	1.25505	0.00000
2014-05-07/07:30:21	3	1.17376	0.00000
2014-05-07/08:28:58	6	19.6940	77.0000
2014-05-07/20:48:58	1	21.2592	419.000
2014-05-07/21:21:56	2	31.1610	85.0000
2014-05-07/21:32:59	3	24.7727	21.0000
2014-05-07/22:21:57	6	49.3050	482.000
2014-05-08/03:47:40	1	36.3110	313.000
2014-05-08/04:21:18	2	2.91075	4.00000
2014-05-08/04:41:39	3	2.69644	0.00000
2014-05-08/04:54:59	4	2.69644	2.00000
2014-05-08/05:06:19	5	2.69644	0.00000
2014-05-08/05:18:22	6	4.60557	12.0000
2014-05-08/10:39:58	1	716.723	0.00000
2014-05-08/11:22:36	2	1700.30	37.0000
2014-05-08/11:31:20	3	28.8668	23.0000
2014-05-08/11:49:18	4	8.49158	2.00000
2014-05-08/12:03:42	5	8.49158	12.0000
2014-05-08/12:20:59	6	90.9067	625.000
2014-05-08/17:40:00	1	10.6814	24.0000
2014-05-08/18:34:20	3	195.311	3.00000
2014-05-08/18:46:39	4	227.590	1.00000
2014-05-08/19:08:41	5	210.834	6.00000
2014-05-08/19:23:58	6	265.204	7.00000
2014-05-09/00:37:01	1	167.611	21.0000
2014-05-09/02:08:39	5	15.6565	47.0000
2014-05-09/02:27:16	6	21.2592	68.0000
2014-05-09/07:37:01	1	19.6940	40.0000
2014-05-09/09:09:47	5	181.700	100.000
2014-05-09/14:36:23	1	2.91075	1.00000

2014-05-09/15:22:54	2	5270.30	43.0000
2014-05-09/15:38:57	3	133.248	0.00000
2014-05-09/15:49:40	4	105.931	0.00000
2014-05-09/16:06:17	5	114.350	8.00000
2014-05-09/16:25:42	6	98.1317	44.0000
2014-05-09/22:47:30	1	15005.6	31.0000
2014-05-09/21:37:38	2	33.6376	155.000
2014-05-09/22:17:21	3	4.26649	8.00000
2014-05-09/22:30:41	4	3.39180	0.00000
2014-05-09/22:45:57	5	3.39180	0.00000
2014-05-09/23:05:23	6	2.69644	1.00000
2014-05-09/23:27:41	7	3.14208	16.0000
2014-05-10/04:15:38	1	15005.6	88.0000
2014-05-10/05:10:03	2	771.000	59.0000
2014-05-10/05:32:27	3	601.000	34.0000
2014-05-10/05:42:03	4	771.000	34.0000
2014-05-10/06:04:27	5	850.300	80.0000
2014-05-10/06:33:15	6	15005.6	81.0000
2014-05-10/11:44:18	1	5.79326	3.00000
2014-05-10/12:35:20	3	3.39180	0.00000
2014-05-10/12:44:59	4	3.14208	3.00000
2014-05-10/12:54:38	5	2.31401	0.00000
2014-05-10/13:15:00	6	2.31401	4.00000
2014-05-10/20:16:01	5	2.14364	1.00000
2014-05-11/00:23:58	1	195.311	44.0000
2014-05-11/01:19:58	3	1.17376	0.00000
2014-05-11/01:40:48	5	15.8000	1546.00
2014-05-11/02:11:40	6	133.248	526.000
2014-05-11/07:26:00	1	36.3110	398.000
2014-05-11/08:13:01	2	2.49792	0.00000
2014-05-12/05:33:22	1	309.034	13.0000
2014-05-12/06:10:01	2	3.14208	6.00000
2014-05-12/06:24:01	3	2.69644	0.00000
2014-05-12/06:42:38	4	2.31401	0.00000
2014-05-12/06:53:01	5	2.49792	1.00000
2014-05-12/07:15:19	6	2.31401	6.00000
2014-05-12/12:38:18	1	6.75071	20.0000
2014-05-12/13:44:09	5	7.40000	63.0000
2014-05-12/14:10:40	6	57.4536	867.000
2014-05-12/19:29:41	1	26.7415	504.000
2014-05-12/20:08:12	2	7469.00	61.0000
2014-05-12/20:24:12	3	5270.30	31.0000
2014-05-12/20:42:38	4	265.204	1.00000
2014-05-12/20:52:37	5	210.834	11.0000
2014-05-12/21:11:38	6	360.108	19.0000
2014-05-13/03:10:40	2	9.50000	145.000
2014-05-13/03:53:41	5	4161.53	0.00000
2014-05-13/04:11:58	6	1539.86	0.00000
2014-05-13/10:08:19	2	15.8000	327.000
2014-05-13/10:21:07	3	11.6000	1010.00
2014-05-13/11:12:38	6	62.0198	283.000
2014-05-13/16:39:57	1	53.2236	352.000
2014-05-13/17:06:01	2	9.89498	16.0000

2014-05-13/17:47:35	5	80.6000	67.0000
2014-05-13/18:09:19	6	452.973	5.00000
2014-05-13/23:46:38	1	98.1317	46.0000
2014-05-14/00:10:41	2	57.4536	25.0000
2014-05-14/01:09:21	6	49.3050	477.000
2014-05-14/06:37:37	1	33.6376	137.000
2014-05-14/06:57:59	2	5.79326	2.00000
2014-05-14/07:57:15	5	67.7000	63.0000
2014-05-14/08:10:03	6	136.300	57.0000
2014-05-14/14:00:30	2	11.6000	13150.0
2014-05-14/14:19:39	3	388.728	2.00000
2014-05-14/14:34:59	4	360.108	0.00000
2014-05-14/14:44:38	5	333.595	0.00000
2014-05-15/03:37:18	1	31.1610	154.000
2014-05-15/05:05:38	6	10.6814	77.0000
2014-05-15/10:34:19	1	143.838	14.0000
2014-05-15/11:04:52	2	5270.30	37.0000
2014-05-15/11:17:40	3	5270.30	28.0000
2014-05-15/11:30:29	4	6279.00	25.0000
2014-05-15/11:49:41	5	8148.90	62.0000
2014-05-15/12:05:21	6	1.17376	0.00000
2014-05-15/17:29:38	1	5.36673	10.0000
2014-05-15/18:11:55	2	6845.60	36.0000
2014-05-15/18:21:31	3	13.7000	337.000
2014-05-15/18:36:01	4	53.2236	16.0000
2014-05-15/18:47:41	5	42.3121	118.000
2014-05-15/19:03:01	6	45.6749	109.000
2014-05-16/01:47:59	5	1859.00	62.0000
2014-05-16/02:03:59	6	15005.6	40.0000
2014-05-16/07:31:39	1	1.17376	2.00000
2014-05-16/08:03:57	2	13747.6	43.0000
2014-05-16/08:16:45	3	15005.6	32.0000
2014-05-16/08:29:33	4	15005.6	32.0000
2014-05-16/08:51:57	5	15005.6	71.0000
2014-05-16/09:06:19	6	1.17376	3.00000
2014-05-16/14:23:59	1	42.3121	257.000
2014-05-16/16:02:19	6	9.16646	15.0000
2014-05-17/05:08:01	2	9701.60	33.0000
2014-05-17/05:47:19	5	42.3121	226.000
2014-05-17/05:59:19	6	42.3121	416.000
2014-05-17/11:18:16	1	10.6814	82.0000
2014-05-17/11:59:32	2	15005.6	57.0000
2014-05-17/12:44:40	5	98.1317	9.00000
2014-05-17/13:01:41	6	98.1317	242.000
2014-05-17/18:24:19	1	14.5038	67.0000
2014-05-17/19:56:08	6	15005.6	56.0000
2014-05-18/01:19:23	1	15005.6	49.0000
2014-05-18/02:39:24	5	771.000	37.0000
2014-05-18/02:58:36	6	2017.70	189.000
2014-05-18/08:20:09	1	12602.9	73.0000
2014-05-18/09:43:21	5	52.1000	106.000
2014-05-18/09:59:21	6	95.9000	67.0000
2014-05-18/15:17:48	1	227.000	53.0000

2014-05-18/15:59:24	2	13.7000	151.000
2014-05-18/16:39:59	5	7.86639	11.0000
2014-05-18/16:59:40	6	6.25368	13.0000
2014-05-18/22:23:20	1	1.35479	4.00000
2014-05-18/22:53:25	2	646.300	81.0000
2014-05-18/23:54:21	6	8.49158	16.0000
2014-05-19/13:00:18	2	11.6000	1874.00
2014-05-19/13:06:42	3	13.7000	10892.0
2014-05-19/13:25:55	4	11.6000	4347.00
2014-05-19/13:41:55	5	13.7000	99.0000
2014-05-19/13:54:43	6	385.700	57.0000
2014-05-19/19:21:58	1	3.14208	2.00000
2014-05-19/19:56:22	2	15005.6	27.0000
2014-05-19/20:09:10	3	8896.90	26.0000
2014-05-19/20:25:10	4	15005.6	29.0000
2014-05-19/20:37:58	5	13747.6	53.0000
2014-05-20/02:55:38	2	13.7000	3710.00
2014-05-20/03:40:26	5	52.1000	151.000
2014-05-20/09:14:43	1	181.700	70.0000
2014-05-20/09:55:59	2	57.4536	17.0000
2014-05-20/10:40:40	5	39.1969	126.000
2014-05-20/10:54:40	6	49.3050	353.000
2014-05-20/16:16:58	1	8.49158	16.0000
2014-05-20/16:50:46	2	11548.9	35.0000
2014-05-20/17:09:58	3	123.438	1.00000
2014-05-20/17:49:57	6	18.2440	65.0000
2014-05-22/03:16:28	1	67.7000	98.0000
2014-05-22/03:42:05	2	52.1000	69.0000
2014-05-22/03:54:53	3	56.9000	55.0000
2014-05-22/04:14:01	4	8.49158	7.00000
2014-05-22/04:29:01	5	8.49158	16.0000
2014-05-22/04:48:59	6	10.6814	34.0000
2014-05-22/10:09:57	1	3.66137	5.00000
2014-05-22/10:49:20	2	10585.6	24.0000
2014-05-22/11:05:20	3	10585.6	26.0000
2014-05-22/11:47:41	6	227.590	33.0000
2014-05-22/17:09:02	1	72.2698	108.000
2014-05-22/17:46:57	2	7.86639	26.0000
2014-05-22/17:56:20	3	33.6376	15.0000
2014-05-22/18:43:41	6	90.9067	1292.00
2014-05-23/00:12:38	1	57.4536	844.000
2014-05-23/01:47:01	6	773.685	1.00000
2014-05-23/07:09:59	1	155.270	319.000
2014-05-23/07:41:40	2	22.9488	100.000
2014-05-23/08:48:19	6	360.108	77.0000
2014-05-23/14:11:38	1	18.2440	143.000
2014-05-23/14:52:41	3	5.79326	1.00000
2014-05-23/15:42:39	6	6.25368	10.0000
2014-05-23/22:51:19	6	1321.47	0.00000
2014-05-24/04:39:53	2	11.6000	1362.00
2014-05-24/05:10:01	4	133.248	1.00000
2014-05-24/05:21:20	5	123.438	4.00000
2014-05-24/05:42:42	6	143.838	65.0000

2014-05-24/11:21:21	1	39.1969	449.000
2014-05-24/12:22:21	5	67.7000	110.000
2014-05-24/12:47:57	6	385.700	61.0000
2014-05-24/18:20:39	1	773.685	0.00000
2014-05-24/19:40:21	6	114.350	47.0000
2014-05-25/01:06:18	1	28.8668	91.0000
2014-05-25/01:42:28	2	7469.00	62.0000
2014-05-25/02:40:04	6	15005.6	49.0000
2014-05-25/08:08:21	1	62.0198	122.000
2014-05-25/15:06:39	1	78.0135	180.000
2014-05-25/15:36:00	2	1.70417	0.00000
2014-05-25/16:40:58	6	5.36673	9.00000
2014-05-25/22:43:24	2	15.8000	295.000
2014-05-25/22:53:00	3	15.8000	286.000
2014-05-25/23:18:36	5	102.300	75.0000
2014-05-25/23:34:36	6	159.000	47.0000
2014-05-26/05:11:18	1	5.36673	4.00000
2014-05-26/05:34:35	2	15005.6	51.0000
2014-05-26/05:47:23	3	15005.6	37.0000
2014-05-26/06:06:35	4	15005.6	34.0000
2014-05-26/06:25:19	5	24.7727	56.0000
2014-05-26/12:29:34	2	20.0000	93.0000
2014-05-26/13:39:59	5	15005.6	43.0000
2014-05-26/19:48:02	3	40.1000	31.0000
2014-05-26/20:13:38	5	33.7000	747.000
2014-05-26/20:34:18	6	167.611	25.0000
2014-05-27/02:28:06	2	5.30000	35.0000
2014-05-27/02:40:54	3	7.40000	38.0000
2014-05-27/03:19:18	5	15.8000	60.0000
2014-05-27/03:35:18	6	26.0000	46.0000
2014-05-27/09:05:01	1	2.69644	4.00000
2014-05-27/09:34:51	2	7469.00	60.0000
2014-05-27/10:26:03	5	351.700	77.0000
2014-05-27/23:48:18	3	47.8000	26.0000
2014-05-28/00:01:06	4	47.8000	24.0000
2014-05-28/00:10:42	5	40.1000	42.0000
2014-05-28/00:28:38	6	245.678	8.00000
2014-05-28/06:02:00	1	33.6376	85.0000
2014-05-28/06:32:35	2	15005.6	49.0000
2014-05-28/07:14:11	5	5.30000	59.0000
2014-05-28/07:30:11	6	13.7000	66.0000
2014-05-28/12:55:34	1	5757.60	56.0000
2014-05-28/14:31:01	6	4.97160	10.0000
2014-05-28/19:53:18	1	6.25368	5.00000
2014-05-28/20:46:02	3	17.9000	201.000
2014-05-28/21:02:02	4	26.0000	198.000
2014-05-28/21:14:50	5	36.8000	403.000
2014-05-28/21:30:50	6	193.000	69.0000
2014-05-29/02:59:42	1	11.5303	43.0000
2014-05-29/11:20:55	5	28.3000	604.000
2014-05-29/11:43:19	6	125.000	51.0000
2014-05-29/16:57:00	1	5.79326	8.00000
2014-05-29/17:31:06	2	11548.9	25.0000

2014-05-29/17:47:07	3	7469.00	25.0000
2014-05-29/18:19:07	5	181.700	74.0000
2014-05-29/18:33:39	6	13.4359	22.0000
2014-05-30/00:30:22	2	13.7000	3498.00
2014-05-30/00:55:58	4	15.8000	9909.00
2014-05-30/01:08:46	5	21.8000	247.000
2014-05-30/06:56:38	1	78.0135	2.00000
2014-05-30/07:27:29	2	15005.6	50.0000
2014-05-30/07:37:05	3	6845.60	36.0000
2014-05-30/07:53:05	4	7469.00	31.0000
2014-05-30/08:15:29	5	9701.60	52.0000
2014-05-30/08:31:29	6	15005.6	48.0000
2014-05-30/13:56:21	1	1.17376	1.00000
2014-05-30/14:19:16	2	47.8000	40.0000
2014-05-30/15:35:42	6	12.4467	12.0000
2014-05-30/21:24:56	2	11.6000	229.000
2014-05-30/21:40:56	3	9.50000	303.000
2014-05-30/21:53:00	4	31.1610	8.00000
2014-05-31/05:10:11	5	9.50000	50.0000
2014-05-31/10:48:21	1	14.5038	28.0000
2014-05-31/12:11:35	5	12602.9	46.0000
2014-05-31/12:32:02	6	1.17376	0.00000
2014-05-31/17:50:21	1	1.57870	0.00000
2014-06-01/00:47:54	1	15005.6	74.0000
2014-06-01/01:23:07	2	181.700	43.0000
2014-06-01/01:32:43	3	181.700	29.0000
2014-06-01/01:55:07	4	147.700	36.0000
2014-06-01/02:04:43	5	181.700	49.0000
2014-06-01/02:23:55	6	1303.70	109.000
2014-06-01/07:56:00	1	1134.04	0.00000
2014-06-01/09:02:55	5	43.8000	108.000
2014-06-01/09:21:00	6	5.36673	8.00000
2014-06-01/14:51:59	1	19.6940	148.000
2014-06-01/16:24:35	6	3411.70	56.0000
2014-06-01/21:49:38	1	1.25505	6.00000
2014-06-01/22:35:50	3	33.7000	66.0000
2014-06-01/22:48:38	4	28.3000	729.000
2014-06-01/23:04:38	5	30.9000	196.000
2014-06-01/23:20:38	6	4839.60	49.0000
2014-06-02/04:48:17	1	7469.00	50.0000
2014-06-02/05:58:41	4	33.7000	417.000
2014-06-02/06:21:05	5	2403.00	66.0000
2014-06-02/12:18:28	2	13.7000	1633.00
2014-06-02/12:56:53	5	23.8000	241.000
2014-06-02/18:48:56	1	67.7000	53.0000
2014-06-02/19:23:20	2	419.623	2.00000
2014-06-02/20:00:38	5	16.9008	30.0000
2014-06-02/20:21:20	6	21.2592	205.000
2014-06-03/01:37:39	1	31.1610	429.000
2014-06-03/02:19:56	2	95.9000	36.0000
2014-06-03/02:58:20	5	5.30000	39.0000
2014-06-03/03:23:56	6	2867.70	43.0000
2014-06-03/15:37:06	1	1859.00	46.0000

2014-06-03/16:17:18	2	5.79326	6.00000
2014-06-03/17:00:18	5	388.728	2.00000
2014-06-03/17:20:40	6	245.678	33.0000
2014-06-03/22:39:40	1	6099.85	0.00000
2014-06-03/23:18:39	2	8.49158	26.0000
2014-06-03/23:28:01	3	4492.28	0.00000
2014-06-03/23:37:20	4	5234.71	1.00000
2014-06-04/00:20:00	5	452.973	16.0000
2014-06-04/05:39:20	1	36.3110	324.000
2014-06-04/06:17:14	2	17.9000	48.0000
2014-06-04/06:23:38	3	15.8000	3899.00
2014-06-04/06:57:38	5	114.350	15.0000
2014-06-04/07:20:41	6	133.248	24.0000
2014-06-04/13:23:59	3	5.30000	40.0000
2014-06-04/13:35:00	4	14.5038	17.0000
2014-06-04/14:05:41	6	3.14208	11.0000
2014-06-04/20:52:18	5	6.25368	4.00000
2014-06-04/21:17:37	6	22.9488	278.000
2014-06-05/03:11:34	2	11.6000	163.000
2014-06-05/03:21:40	3	16.9008	47.0000
2014-06-05/04:10:18	6	98.1317	258.000
2014-06-05/09:40:01	1	98.1317	18.0000
2014-06-05/11:15:39	6	10.6814	84.0000
2014-06-05/16:39:41	1	31.1610	248.000
2014-06-05/17:07:21	2	716.723	2.00000
2014-06-05/18:15:41	6	133.248	472.000
2014-06-05/23:36:58	1	62.0198	706.000
2014-06-06/00:06:58	2	24.7727	30.0000
2014-06-06/00:47:59	5	3.20000	40.0000
2014-06-06/01:18:39	6	309.034	8.00000
2014-06-06/06:30:59	1	195.311	5.00000
2014-06-06/07:07:38	2	1.17376	2.00000
2014-06-06/07:21:01	3	1.17376	1.00000
2014-06-06/07:39:59	4	1.35479	0.00000
2014-06-06/07:50:01	5	1.46247	1.00000
2014-06-06/08:14:40	6	3.14208	3.00000
2014-06-06/13:31:40	1	10.6814	18.0000
2014-06-06/13:58:32	2	13747.6	56.0000
2014-06-06/14:11:20	3	6845.60	17.0000
2014-06-06/14:30:33	4	7469.00	30.0000
2014-06-06/14:46:33	5	9701.60	46.0000
2014-06-06/15:15:41	6	1.35479	4.00000
2014-06-06/21:01:00	2	11.6000	600.000
2014-06-06/21:55:24	5	5.30000	41.0000
2014-06-06/22:16:21	6	14.5038	23.0000
2014-06-07/04:07:33	2	11.6000	11827.0
2014-06-07/04:23:33	3	13.7000	511.000
2014-06-07/04:38:19	4	45.6749	25.0000
2014-06-07/04:53:19	5	49.3050	99.0000
2014-06-07/05:10:16	6	49.3050	49.0000
2014-06-07/10:29:21	1	114.350	727.000
2014-06-07/11:31:21	4	7.40000	30.0000
2014-06-07/11:47:21	5	11.6000	66.0000

2014-06-07/12:12:57	6	62.1000	42.0000
2014-06-07/18:59:25	5	40.1000	28.0000
2014-06-08/00:34:58	1	3.14208	2.00000
2014-06-08/00:54:40	2	95.9000	57.0000
2014-06-08/02:11:28	6	646.300	155.000
2014-06-08/15:27:19	4	1224.17	0.00000
2014-06-08/15:49:38	5	773.685	0.00000
2014-06-08/16:11:00	6	716.723	1.00000
2014-06-09/04:32:58	1	2.49792	4.00000
2014-06-09/05:05:21	2	7469.00	79.0000
2014-06-09/06:03:59	6	10.6814	33.0000
2014-06-09/11:28:56	1	11.5303	42.0000
2014-06-09/13:04:19	6	195.311	8.00000
2014-06-09/18:33:22	1	49.3050	105.000
2014-06-09/18:58:21	2	1.17376	1.00000
2014-06-10/01:32:41	1	5.79326	55.0000
2014-06-10/03:02:52	6	15005.6	50.0000
2014-06-10/08:34:59	1	1.17376	5.00000
2014-06-10/09:05:37	2	2867.70	45.0000
2014-06-10/10:01:56	6	615.070	3.00000
2014-06-10/15:15:58	1	210.834	5.00000
2014-06-10/17:16:56	6	7.86639	7.00000
2014-06-11/00:06:49	6	67.7000	47.0000
2014-06-11/06:02:04	2	7.40000	48.0000
2014-06-11/06:11:40	3	7.40000	19.0000
2014-06-11/06:27:40	4	7.40000	31.0000
2014-06-11/06:40:28	5	7.40000	47.0000
2014-06-11/07:09:16	6	36.8000	40.0000
2014-06-11/12:04:50	1	465.000	92.0000
2014-06-11/13:24:51	4	227.000	32.0000
2014-06-11/13:42:38	5	6.25368	2.00000
2014-06-11/14:16:40	6	7.86639	9.00000
2014-06-11/19:17:18	1	2.69644	2.00000
2014-06-11/20:21:16	4	15.6565	21.0000
2014-06-11/20:41:58	5	11.5303	84.0000
2014-06-11/21:08:58	6	14.5038	55.0000
2014-06-12/02:26:38	1	4.60557	17.0000
2014-06-12/02:59:54	2	1700.30	45.0000
2014-06-12/03:41:30	5	33.7000	359.000
2014-06-12/04:10:19	6	351.700	63.0000
2014-06-12/09:16:18	1	2.49792	3.00000
2014-06-12/09:58:54	2	1553.00	38.0000
2014-06-12/10:05:18	3	1428.30	23.0000
2014-06-12/10:24:30	4	1303.70	25.0000
2014-06-12/10:37:18	5	1303.70	88.0000
2014-06-12/11:02:54	6	5270.30	45.0000
2014-06-12/16:14:18	1	11.5303	12.0000
2014-06-12/17:56:57	6	3128.30	67.0000
2014-06-12/23:18:58	1	84.2137	396.000
2014-06-12/23:48:19	2	2.91075	2.00000
2014-06-13/00:04:19	3	2.91075	1.00000
2014-06-13/06:21:16	1	5.79326	26.0000
2014-06-13/13:55:52	2	23.8000	57.0000

2014-06-13/14:05:29	3	21.8000	23.0000
2014-06-13/14:18:17	4	9.50000	158.000
2014-06-13/14:53:29	6	7469.00	42.0000
2014-06-13/20:22:20	1	36.3110	302.000
2014-06-13/20:42:20	2	43.8000	53.0000
2014-06-14/03:20:21	1	1009.00	298.000
2014-06-14/10:44:08	2	13.7000	541.000
2014-06-14/10:56:56	3	11.6000	71.0000
2014-06-14/11:19:21	4	9.50000	182.000
2014-06-14/17:16:41	1	3.66137	5.00000
2014-06-14/17:39:56	2	1009.00	60.0000
2014-06-15/07:17:07	1	6845.60	74.0000
2014-06-15/07:49:07	2	21.8000	72.0000
2014-06-15/14:17:39	1	4.26649	13.0000
2014-06-15/15:25:43	5	40.1000	158.000
2014-06-15/15:51:19	6	3128.30	68.0000
2014-06-15/21:14:34	1	8148.90	39.0000
2014-06-15/22:12:10	4	13.7000	1747.00
2014-06-15/22:31:22	5	15.8000	1310.00
2014-06-15/23:00:11	6	215.700	47.0000
2014-06-16/04:08:00	1	57.4536	654.000
2014-06-16/05:31:40	5	10.6814	11.0000
2014-06-16/05:53:38	6	45.6749	405.000
2014-06-16/11:10:18	1	22.9488	94.0000
2014-06-16/12:40:59	5	24.7727	227.000
2014-06-16/18:10:01	1	18.2440	84.0000
2014-06-16/19:22:34	5	80.6000	101.000
2014-06-16/19:48:10	6	385.700	30.0000
2014-06-17/00:58:38	1	31.1610	173.000
2014-06-17/02:31:25	5	28.3000	50.0000
2014-06-17/02:53:49	6	646.300	101.000
2014-06-17/07:57:38	1	26.7415	94.0000
2014-06-17/08:40:34	2	2867.70	44.0000
2014-06-17/08:50:10	3	2210.30	24.0000
2014-06-17/09:22:10	5	147.700	39.0000
2014-06-17/09:57:23	6	4839.60	67.0000
2014-06-17/15:05:01	1	15.6565	71.0000
2014-06-17/15:41:58	2	2629.70	30.0000
2014-06-17/15:54:46	3	2017.70	20.0000
2014-06-17/16:04:22	4	1700.30	15.0000
2014-06-17/17:02:18	6	33.6376	151.000
2014-06-17/23:54:38	6	773.685	4.00000
2014-06-18/05:06:00	1	33.6376	227.000
2014-06-19/02:35:04	2	26.0000	65.0000
2014-06-19/23:32:52	2	9.50000	78.0000
2014-06-20/00:37:00	6	167.611	7.00000
2014-06-20/06:04:18	1	62.0198	5.00000
2014-06-20/06:28:56	2	850.300	32.0000
2014-06-20/06:48:08	3	714.300	12.0000
2014-06-20/07:42:32	6	9701.60	46.0000
2014-06-20/13:09:59	1	18.2440	118.000
2014-06-20/13:38:55	2	13.7000	622.000
2014-06-20/13:45:19	3	11.6000	950.000

2014-06-20/14:01:19	4	3.20000	28.0000
2014-06-20/14:14:07	5	5.30000	47.0000
2014-06-20/14:33:19	6	47.8000	64.0000
2014-06-20/20:08:21	1	16.9008	166.000
2014-06-20/21:28:41	6	663.954	0.00000
2014-06-21/09:59:40	1	57.4536	427.000
2014-06-21/11:14:02	5	13.7000	546.000
2014-06-21/11:39:38	6	646.300	116.000
2014-06-21/17:04:02	1	1553.00	226.000
2014-06-21/18:11:14	5	3.20000	57.0000
2014-06-21/18:33:38	6	159.000	41.0000
2014-06-21/23:52:37	1	15005.6	51.0000
2014-06-22/00:34:14	2	5270.30	35.0000
2014-06-22/01:15:50	5	33.7000	119.000
2014-06-22/06:42:17	1	3.20000	41.0000
2014-06-22/13:53:40	1	9.89498	15.0000
2014-06-22/14:30:37	2	295.000	43.0000
2014-06-22/14:43:25	3	249.700	33.0000
2014-06-22/14:59:25	4	329.000	44.0000
2014-06-22/15:15:25	5	385.700	57.0000
2014-06-22/15:37:49	6	499.000	63.0000
2014-06-22/20:53:36	1	10585.6	44.0000
2014-06-23/10:52:18	1	2629.70	258.000
2014-06-23/19:12:07	5	181.700	43.0000
2014-06-23/19:36:19	6	66.9489	105.000
2014-06-24/16:07:11	5	47.8000	138.000
2014-06-24/16:26:23	6	136.300	47.0000
2014-06-24/21:52:00	1	9.16646	3.00000
2014-06-24/23:30:00	6	3.66137	5.00000
2014-06-25/11:59:00	1	2.14364	5.00000
2014-06-25/20:26:19	6	98.1317	15.0000
2014-06-26/01:44:41	1	53.2236	93.0000
2014-06-26/02:45:48	4	30.9000	19.0000
2014-06-26/03:29:23	6	569.786	0.00000
2014-06-26/08:47:59	1	309.034	13.0000
2014-06-26/10:30:20	6	84.2137	28.0000
2014-06-26/15:39:39	1	9.16646	38.0000
2014-06-26/16:55:27	5	4057.60	38.0000
2014-06-26/17:37:04	6	15005.6	63.0000
2014-06-26/22:53:58	1	31.1610	427.000
2014-06-26/23:15:30	2	5.30000	27.0000
2014-06-27/00:00:19	5	56.9000	40.0000
2014-06-27/00:29:07	6	351.700	74.0000
2014-06-27/05:23:37	1	18.2440	41.0000
2014-06-27/07:00:55	5	30.9000	40.0000
2014-06-27/08:01:44	6	15005.6	51.0000
2014-06-27/12:43:22	1	1.17376	1.00000
2014-06-27/13:59:23	5	11.6000	688.000
2014-06-27/19:50:38	1	19.6940	111.000
2014-06-27/20:14:41	2	2.69644	1.00000
2014-06-27/20:30:41	3	1.46247	0.00000
2014-06-27/21:03:39	5	22.9488	85.0000
2014-06-27/21:31:19	6	26.7415	92.0000

2014-06-28/02:52:19	1	2.69644	0.00000
2014-06-28/03:21:05	2	15005.6	58.0000
2014-06-28/03:30:41	3	15005.6	21.0000
2014-06-28/03:40:17	4	15005.6	27.0000
2014-06-28/03:59:29	5	13747.6	24.0000
2014-06-28/04:28:17	6	15005.6	49.0000
2014-06-28/16:46:48	1	15005.6	33.0000
2014-06-28/18:06:48	6	714.300	70.0000
2014-06-28/18:35:37	7	15005.6	38.0000
2014-06-29/00:06:45	2	113.700	64.0000
2014-06-29/01:21:20	6	6.25368	13.0000
2014-06-29/08:28:25	6	6279.00	36.0000
2014-06-29/13:48:44	1	11548.9	46.0000
2014-06-29/14:20:44	2	113.700	55.0000
2014-06-29/14:33:18	3	21.2592	8.00000
2014-06-29/14:42:41	4	16.9008	16.0000
2014-06-29/15:08:01	5	18.2440	47.0000
2014-06-29/15:27:18	6	28.8668	145.000
2014-06-29/20:43:58	1	569.786	1.00000
2014-06-29/22:27:03	6	9.89498	20.0000
2014-06-30/03:48:38	1	2.31401	5.00000
2014-06-30/04:11:09	2	15005.6	72.0000
2014-06-30/05:02:21	5	125.000	306.000
2014-06-30/05:24:45	6	227.000	85.0000
2014-06-30/12:10:25	5	11.6000	39.0000
2014-06-30/17:49:40	1	2629.70	40.0000
2014-07-01/01:08:24	2	13.7000	43.0000
2014-07-01/01:27:36	3	11.6000	1314.00
2014-07-01/01:43:36	4	11.6000	6126.00
2014-07-01/02:02:48	5	15.8000	36.0000
2014-07-01/02:20:39	6	33.6376	412.000
2014-07-01/07:49:23	1	13.4359	165.000
2014-07-01/09:24:18	6	66.9489	42.0000
2014-07-01/14:45:06	1	9701.60	61.0000
2014-07-01/15:13:54	2	15.8000	303.000
2014-07-01/15:29:55	3	20.0000	19.0000
2014-07-02/05:22:18	3	9.50000	83.0000
2014-07-02/05:38:18	4	9.50000	87.0000
2014-07-02/11:47:45	1	850.300	540.000
2014-07-02/12:06:57	2	159.000	95.0000
2014-07-02/12:22:57	3	113.700	28.0000
2014-07-02/12:38:57	4	80.6000	26.0000
2014-07-02/12:58:09	5	73.9000	126.000
2014-07-02/13:17:58	6	3.14208	3.00000
2014-07-02/19:11:32	2	26.0000	115.000
2014-07-02/20:15:19	6	615.070	2.00000
2014-07-03/01:39:18	1	57.4536	1399.00
2014-07-03/02:04:40	2	385.700	210.000
2014-07-03/02:20:40	3	295.000	35.0000
2014-07-03/02:36:40	4	227.000	25.0000
2014-07-03/02:49:28	5	249.700	59.0000
2014-07-03/15:39:19	1	4431.60	69.0000
2014-07-03/16:04:55	2	3128.30	51.0000

2014-07-03/16:56:07	5	80.6000	72.0000
2014-07-03/17:21:18	6	45.6749	1004.00
2014-07-04/00:16:40	6	716.723	0.00000
2014-07-04/05:37:18	1	6.25368	11.0000
2014-07-04/06:28:14	4	5.30000	20.0000
2014-07-04/07:21:19	6	1.35479	4.00000
2014-07-04/12:39:41	1	22.9488	349.000
2014-07-04/13:07:41	2	1.70417	1.00000
2014-07-04/19:42:41	1	2.31401	3.00000
2014-07-04/20:07:46	2	9.50000	743.000
2014-07-04/20:23:00	3	569.786	0.00000
2014-07-04/21:23:01	6	167.611	10.0000
2014-07-05/07:47:48	1	15005.6	45.0000
2014-07-05/08:32:36	4	15.8000	71.0000
2014-07-05/09:22:38	6	22.9488	330.000
2014-07-05/14:53:40	1	8.49158	68.0000
2014-07-05/15:14:21	2	3.95237	3.00000
2014-07-05/16:25:01	6	663.954	1.00000
2014-07-05/23:17:21	6	452.973	1.00000
2014-07-07/04:01:37	2	7.40000	41.0000
2014-07-07/04:17:37	3	7.40000	28.0000
2014-07-07/04:29:19	4	114.350	1.00000
2014-07-07/04:48:00	5	84.2137	20.0000
2014-07-07/11:03:38	2	9651.57	0.00000
2014-07-07/17:34:20	1	45.6749	400.000
2014-07-07/18:04:40	2	15.6565	29.0000
2014-07-07/18:20:21	3	14.5038	22.0000
2014-07-07/18:35:41	4	12.4467	8.00000
2014-07-07/18:48:41	5	11.5303	13.0000
2014-07-07/19:25:59	6	78.0135	368.000
2014-07-08/00:32:20	1	57.4536	471.000
2014-07-08/01:05:16	2	3411.70	31.0000
2014-07-08/01:11:40	3	5.30000	27.0000
2014-07-08/01:44:21	5	2257.09	1.00000
2014-07-08/02:09:00	6	2090.91	1.00000
2014-07-08/08:02:45	2	13.7000	138.000
2014-07-08/08:15:33	3	11.6000	59.0000
2014-07-08/08:22:20	4	5234.71	0.00000
2014-07-08/08:44:58	5	2090.91	3.00000
2014-07-08/09:12:58	6	2090.91	0.00000
2014-07-08/15:04:08	2	9701.60	30.0000
2014-07-08/16:14:00	6	309.034	31.0000
2014-07-08/22:03:40	2	9.50000	44.0000
2014-07-08/22:13:18	3	105.931	14.0000
2014-07-08/22:24:41	4	90.9067	9.00000
2014-07-08/22:48:03	5	84.2137	30.0000
2014-07-08/23:18:20	6	90.9067	66.0000
2014-07-09/04:27:19	1	105.931	136.000
2014-07-09/05:45:41	5	18.2440	84.0000
2014-07-09/06:17:57	6	31.1610	89.0000
2014-07-09/11:30:01	1	72.2698	576.000
2014-07-09/11:56:57	2	12.4467	18.0000
2014-07-09/12:11:01	3	9.16646	19.0000

2014-07-09/12:17:59	4	10.6814	0.00000
2014-07-09/12:52:40	5	13.4359	21.0000
2014-07-09/13:17:00	6	33.6376	125.000
2014-07-09/19:18:19	1	15005.6	25.0000
2014-07-09/19:02:18	3	11.6000	172.000
2014-07-09/20:18:18	7	6.75071	1.00000
2014-07-10/01:55:26	2	5.30000	44.0000
2014-07-10/02:40:14	5	5.30000	27.0000
2014-07-10/03:15:27	6	8148.90	47.0000
2014-07-10/08:26:36	1	1.83961	3.00000
2014-07-10/09:12:01	3	773.685	0.00000
2014-07-10/09:20:19	4	835.175	0.00000
2014-07-10/09:44:18	5	716.723	0.00000
2014-07-10/10:12:18	6	1321.47	4.00000
2014-07-10/15:24:16	1	98.1317	412.000
2014-07-10/15:51:20	2	1.17376	0.00000
2014-07-10/17:17:00	6	90.9067	66.0000
2014-07-10/22:50:36	2	7.40000	42.0000
2014-07-11/00:08:16	6	1.17376	0.00000
2014-07-11/06:18:56	4	13.7000	10365.0
2014-07-11/07:07:41	6	1.83961	0.00000
2014-07-11/12:49:24	2	5.30000	40.0000
2014-07-11/14:09:43	6	8.49158	9.00000
2014-07-11/19:24:18	1	6.75071	8.00000
2014-07-11/19:51:21	2	1.17376	3.00000
2014-07-11/21:07:01	6	3717.60	49.0000
2014-07-12/02:23:04	1	15005.6	64.0000
2014-07-12/02:58:16	2	7.40000	43.0000
2014-07-12/03:07:52	3	9.50000	116.000
2014-07-12/03:30:17	4	13.7000	9458.00
2014-07-12/03:39:53	5	15.8000	53.0000
2014-07-12/09:23:59	1	360.108	23.0000
2014-07-12/09:54:20	2	87.9000	29.0000
2014-07-12/10:07:08	3	5.30000	23.0000
2014-07-12/10:16:44	4	5.30000	20.0000
2014-07-12/16:21:02	1	5.79326	10.0000
2014-07-12/23:16:03	1	15005.6	60.0000
2014-07-12/23:54:27	2	1859.00	51.0000
2014-07-13/00:10:27	3	13.7000	3152.00
2014-07-13/01:14:27	6	15005.6	43.0000
2014-07-13/06:19:40	1	5.79326	14.0000
2014-07-13/07:21:43	4	7.40000	112.000
2014-07-13/07:37:43	5	15.8000	281.000
2014-07-13/08:06:31	6	1700.30	49.0000
2014-07-13/13:23:38	1	4839.60	48.0000
2014-07-13/13:58:50	2	33.7000	120.000
2014-07-13/14:40:26	5	9.50000	53.0000
2014-07-13/20:19:01	1	3.95237	16.0000
2014-07-13/20:51:58	2	9701.60	72.0000
2014-07-13/21:39:58	5	113.700	71.0000
2014-07-13/22:08:46	6	1553.00	46.0000
2014-07-14/03:17:17	1	105.931	35.0000
2014-07-14/05:06:20	6	16.9008	119.000

2014-07-14/10:24:17	1	31.1610	358.000
2014-07-14/10:51:04	2	9.50000	30.0000
2014-07-14/11:03:40	3	53.2236	3.00000
2014-07-14/11:13:19	4	62.0198	6.00000
2014-07-14/11:36:01	5	72.2698	12.0000
2014-07-14/12:00:40	6	98.1317	560.000
2014-07-14/17:13:22	1	18.2440	218.000
2014-07-14/19:05:22	6	53.2236	269.000
2014-07-15/00:53:04	2	11.6000	3373.00
2014-07-15/01:05:52	3	11.6000	17.0000
2014-07-15/01:16:38	4	36.3110	21.0000
2014-07-15/02:07:00	6	14.5038	98.0000
2014-07-15/07:26:59	1	33.6376	482.000
2014-07-15/07:57:07	2	15005.6	42.0000
2014-07-15/08:27:40	5	8.49158	6.00000
2014-07-15/09:02:18	6	66.9489	284.000
2014-07-15/23:08:43	5	385.700	38.0000
2014-07-16/04:51:26	2	6845.60	32.0000
2014-07-16/06:08:14	6	15005.6	59.0000
2014-07-16/11:42:23	2	9.50000	54.0000
2014-07-16/12:01:35	3	7.40000	25.0000
2014-07-16/12:07:59	4	7.40000	51.0000
2014-07-16/12:23:59	5	20.0000	44.0000
2014-07-16/13:13:58	6	2.31401	2.00000
2014-07-16/18:18:18	1	14.5038	83.0000
2014-07-16/18:47:14	2	5270.30	38.0000
2014-07-16/19:00:02	3	4057.60	31.0000
2014-07-16/19:09:39	4	3411.70	24.0000
2014-07-16/19:28:51	5	4057.60	44.0000
2014-07-17/01:19:20	1	4.60557	3.00000
2014-07-17/01:49:58	2	499.000	37.0000
2014-07-17/02:02:40	3	24.7727	28.0000
2014-07-17/08:49:30	2	21.8000	45.0000
2014-07-17/08:59:06	3	21.8000	41.0000
2014-07-17/09:24:42	5	13.7000	520.000
2014-07-17/09:54:38	6	1.83961	2.00000
2014-07-17/15:21:23	1	26.7415	131.000
2014-07-17/15:41:00	2	8.49158	16.0000
2014-07-17/16:57:38	6	1.25505	1.00000
2014-07-17/22:12:19	1	143.838	33.0000
2014-07-17/22:38:58	2	351.700	49.0000
2014-07-18/05:09:01	1	66.9489	375.000
2014-07-18/05:58:59	3	2.49792	0.00000
2014-07-18/06:04:00	4	2.49792	1.00000
2014-07-18/07:07:38	6	90.9067	43.0000
2014-07-18/12:09:39	1	24.7727	91.0000
2014-07-18/12:57:14	3	11.6000	3568.00
2014-07-18/13:06:50	4	11.6000	5563.00
2014-07-18/13:22:50	5	9.50000	37.0000
2014-07-18/14:01:14	6	419.700	72.0000
2014-07-18/19:25:00	1	8.49158	17.0000
2014-07-18/19:41:47	2	1303.70	63.0000
2014-07-18/19:57:47	3	7.40000	68.0000

2014-07-19/02:40:14	2	7.40000	37.0000
2014-07-19/02:59:27	3	33.7000	22.0000
2014-07-19/03:09:03	4	15.8000	142.000
2014-07-19/03:21:51	5	15.8000	1413.00
2014-07-19/09:30:10	1	56.9000	49.0000
2014-07-19/09:46:10	2	40.1000	82.0000
2014-07-19/09:58:58	3	33.7000	24.0000
2014-07-19/10:05:22	4	30.9000	22.0000
2014-07-19/10:24:34	5	33.7000	88.0000
2014-07-19/16:42:30	2	13.7000	5110.00
2014-07-19/16:55:18	3	17.9000	63.0000
2014-07-19/17:04:54	4	30.9000	32.0000
2014-07-19/17:20:54	5	36.8000	38.0000
2014-07-19/23:46:21	2	30.9000	252.000
2014-07-20/00:44:39	6	1224.17	1.00000
2014-07-20/06:21:23	1	9.89498	63.0000
2014-07-20/06:40:40	2	3.14208	0.00000
2014-07-20/06:53:40	3	2.31401	1.00000
2014-07-20/07:04:19	4	2.69644	0.00000
2014-07-20/07:15:38	5	2.69644	3.00000
2014-07-20/07:43:38	6	6.25368	5.00000
2014-07-20/13:18:21	1	3.39180	0.00000
2014-07-20/13:44:20	2	15005.6	38.0000
2014-07-20/13:57:08	3	15005.6	23.0000
2014-07-20/14:09:56	4	15005.6	46.0000
2014-07-20/14:19:32	5	15005.6	34.0000
2014-07-20/14:40:36	6	1.98581	7.00000
2014-07-20/20:16:58	1	3.14208	5.00000
2014-07-20/20:40:41	2	1.17376	0.00000
2014-07-20/21:50:48	6	73.9000	40.0000
2014-07-21/17:14:38	1	8896.90	73.0000
2014-07-21/17:40:15	2	4057.60	52.0000
2014-07-22/14:08:58	1	53.2236	58.0000
2014-07-22/21:37:12	2	5.30000	30.0000
2014-07-22/21:50:18	3	488.974	0.00000
2014-07-22/22:00:41	4	360.108	1.00000
2014-07-22/22:13:40	5	388.728	1.00000
2014-07-22/22:45:41	6	333.595	3.00000
2014-07-23/04:08:37	1	133.248	161.000
2014-07-23/04:43:08	2	13.7000	165.000
2014-07-23/05:31:08	5	20.0000	38.0000
2014-07-23/05:56:45	6	11548.9	43.0000
2014-07-23/11:15:57	1	62.0198	924.000
2014-07-23/12:19:39	5	1662.25	2.00000
2014-07-23/12:47:18	6	2436.47	0.00000
2014-07-23/19:38:20	6	180.932	11.0000
2014-07-24/08:37:48	2	9.50000	31.0000
2014-07-24/08:50:36	3	17.9000	55.0000
2014-07-24/09:00:12	4	21.8000	180.000
2014-07-24/09:13:00	5	17.9000	54.0000
2014-07-24/15:03:15	1	15005.6	49.0000
2014-07-24/16:48:00	6	10.6814	22.0000
2014-07-24/22:06:00	1	7.86639	43.0000

2014-07-24/22:35:00	2	4.26649	2.00000
2014-07-25/05:02:19	1	601.000	77.0000
2014-07-25/05:37:31	2	125.000	53.0000
2014-07-25/06:22:19	5	52.1000	45.0000
2014-07-25/06:59:39	6	2839.15	0.00000
2014-07-25/11:54:59	1	527.835	14.0000
2014-07-25/12:32:18	2	8.49158	11.0000
2014-07-25/12:47:58	3	1.46247	0.00000
2014-07-25/12:53:56	4	1.17376	0.00000
2014-07-25/18:59:01	1	143.838	54.0000
2014-07-25/19:33:39	2	9.89498	12.0000
2014-07-25/19:49:40	3	9.16646	4.00000
2014-07-25/19:55:01	4	9.16646	7.00000
2014-07-25/20:24:01	5	9.89498	12.0000
2014-07-25/20:48:40	6	13.4359	34.0000
2014-07-26/01:58:00	1	42.3121	313.000
2014-07-26/02:37:40	2	12.4467	22.0000
2014-07-26/03:56:18	6	114.350	23.0000
2014-07-26/09:28:58	2	8.49158	5.00000
2014-07-26/10:44:43	6	1.46247	6.00000
2014-07-26/15:54:40	1	36.3110	299.000
2014-07-26/16:22:20	2	2.91075	1.00000
2014-07-26/17:07:00	5	2.49792	0.00000
2014-07-26/17:47:40	6	53.2236	131.000
2014-07-26/23:05:03	1	1.57870	0.00000
2014-07-26/23:30:04	2	15.8000	7761.00
2014-07-27/06:02:21	1	53.2236	1443.00
2014-07-27/06:29:36	2	8148.90	47.0000
2014-07-27/07:11:21	5	22.9488	48.0000
2014-07-27/07:49:19	6	36.3110	109.000
2014-07-27/13:11:41	1	5.79326	51.0000
2014-07-27/13:36:20	2	2.14364	2.00000
2014-07-27/14:08:31	5	11.6000	69.0000
2014-07-27/14:40:31	6	15005.6	50.0000
2014-07-27/19:50:21	1	18.2440	110.000
2014-07-27/20:21:54	2	15005.6	37.0000
2014-07-27/20:45:21	3	21.2592	54.0000
2014-07-27/20:48:42	4	28.8668	17.0000
2014-07-27/20:59:41	5	26.7415	40.0000
2014-07-27/21:57:41	6	39.1969	203.000
2014-07-28/02:50:19	1	15.6565	67.0000
2014-07-28/03:23:01	2	12.4467	0.00000
2014-07-28/09:51:58	1	2867.70	77.0000
2014-07-28/10:30:22	2	385.700	49.0000
2014-07-28/10:43:11	3	272.300	28.0000
2014-07-28/10:49:35	4	272.300	37.0000
2014-07-28/11:18:23	5	295.000	94.0000
2014-07-28/11:50:23	6	465.000	478.000
2014-07-28/16:54:42	1	1428.30	80.0000
2014-07-28/17:26:42	2	15005.6	35.0000
2014-07-28/18:11:30	5	181.700	61.0000
2014-07-28/18:39:01	6	12.4467	113.000
2014-07-28/23:51:59	1	133.248	110.000

2014-07-29/00:28:01	2	49.3050	26.0000
2014-07-29/01:17:26	5	7.40000	35.0000
2014-07-29/01:46:14	6	159.000	66.0000
2014-07-29/06:52:21	1	53.2236	44.0000
2014-07-29/07:22:38	2	6.25368	2.00000
2014-07-29/13:56:59	1	835.175	0.00000
2014-07-29/14:21:38	2	488.974	2.00000
2014-07-29/14:44:35	3	11548.9	31.0000
2014-07-29/14:54:11	4	12602.9	25.0000
2014-07-29/21:21:26	2	9.50000	338.000
2014-07-29/22:35:39	6	3.66137	4.00000
2014-07-30/04:24:10	2	26.0000	262.000
2014-07-30/05:41:42	6	57.4536	873.000
2014-07-30/11:34:11	2	11.6000	821.000
2014-07-30/12:46:19	6	42.3121	514.000
2014-07-30/17:47:41	1	5.36673	4.00000
2014-07-30/18:30:01	2	4.97160	4.00000
2014-07-30/19:11:03	5	7.40000	41.0000
2014-07-30/19:43:03	6	351.700	100.000
2014-07-31/01:28:58	2	11.6000	6978.00
2014-07-31/02:10:34	5	17.9000	44.0000
2014-07-31/07:34:05	1	6279.00	38.0000
2014-07-31/09:13:18	5	7.40000	46.0000
2014-07-31/14:43:59	1	13.4359	37.0000
2014-07-31/15:22:39	2	15.8000	68.0000
2014-07-31/16:04:15	5	15.8000	86.0000
2014-07-31/16:49:39	6	123.438	35.0000
2014-07-31/23:08:51	5	11.6000	63.0000
2014-07-31/23:42:39	6	4.60557	3.00000
2014-08-01/05:29:58	2	13.7000	6516.00
2014-08-01/06:49:22	6	16.9008	32.0000
2014-08-01/13:45:18	6	527.835	2.00000
2014-08-01/18:41:20	1	16.9008	142.000
2014-08-01/19:38:35	4	26.0000	197.000
2014-08-01/19:56:57	5	57.4536	37.0000
2014-08-01/20:37:40	6	66.9489	1111.00
2014-08-02/01:42:40	1	14.5038	34.0000
2014-08-02/02:25:40	2	5.79326	2.00000
2014-08-02/03:57:42	6	45.6749	134.000
2014-08-02/10:03:38	5	1321.47	0.00000
2014-08-02/10:57:01	6	773.685	1.00000
2014-08-02/15:38:40	1	42.3121	142.000
2014-08-02/16:27:21	2	2.49792	2.00000
2014-08-02/23:17:26	2	15.8000	272.000
2014-08-03/06:39:06	4	11.6000	2225.00
2014-08-03/07:01:30	5	30.9000	118.000
2014-08-03/13:20:31	2	11.6000	78.0000
2014-08-03/20:15:46	2	17.9000	236.000
2014-08-03/20:57:23	5	43.8000	57.0000
2014-08-04/02:49:42	1	329.000	76.0000
2014-08-04/04:03:18	5	15.8000	54.0000
2014-08-04/04:41:19	6	19.6940	60.0000
2014-08-04/09:45:02	1	62.0198	492.000

2014-08-04/10:11:21	2	4.97160	1.00000
2014-08-04/11:44:40	6	6.75071	17.0000
2014-08-04/16:42:03	1	6.25368	6.00000
2014-08-04/17:17:36	2	499.000	40.0000
2014-08-04/18:05:37	5	215.700	44.0000
2014-08-04/18:31:13	6	15005.6	36.0000
2014-08-05/01:01:40	4	15.8000	62.0000
2014-08-05/06:44:01	1	1.35479	0.00000
2014-08-05/07:17:27	2	15005.6	52.0000
2014-08-05/08:41:59	6	57.4536	314.000
2014-08-05/14:12:42	2	28.3000	180.000
2014-08-05/15:03:55	5	26.0000	44.0000
2014-08-05/15:39:58	6	18.2440	72.0000
2014-08-05/20:36:44	1	28.8668	100.000
2014-08-06/03:30:21	1	10.6814	15.0000
2014-08-06/04:07:20	2	2.31401	2.00000
2014-08-06/17:22:00	1	2.14364	2.00000
2014-08-06/19:43:41	6	28.8668	98.0000
2014-08-07/00:30:59	1	36.3110	69.0000
2014-08-07/01:17:40	2	1.17376	0.00000
2014-08-07/02:01:16	5	17.9000	35.0000
2014-08-07/02:33:41	6	133.248	17.0000
2014-08-07/08:38:24	1	15005.6	29.0000
2014-08-07/07:35:19	2	98.1317	80.0000
2014-08-07/08:17:39	3	3.39180	8.00000
2014-08-07/09:37:58	6	615.070	0.00000
2014-08-07/14:28:18	1	90.9067	33.0000
2014-08-07/15:06:59	2	601.000	54.0000
2014-08-07/16:44:00	6	18.2440	122.000
2014-08-07/21:32:40	1	11.5303	26.0000
2014-08-07/23:37:39	6	90.9067	79.0000
2014-08-08/04:35:01	1	33.6376	294.000
2014-08-08/05:43:22	4	33.7000	69.0000
2014-08-08/06:47:23	5	12602.9	46.0000
2014-08-08/11:27:39	1	15.6565	256.000
2014-08-08/12:09:19	2	1.57870	3.00000
2014-08-08/13:25:00	6	167.611	83.0000
2014-08-08/18:20:20	1	45.6749	242.000
2014-08-08/19:08:18	2	1.17376	0.00000
2014-08-09/02:09:46	2	20.0000	856.000
2014-08-09/08:23:01	1	39.1969	274.000
2014-08-09/09:11:39	2	1.70417	1.00000
2014-08-09/15:34:41	1	9.89498	16.0000
2014-08-09/16:13:11	2	3411.70	34.0000
2014-08-09/17:31:58	6	36.3110	212.000
2014-08-10/06:28:21	1	3.14208	2.00000
2014-08-10/12:41:39	1	11.5303	28.0000
2014-08-10/13:05:18	2	1.17376	1.00000
2014-08-10/19:35:42	1	8.49158	17.0000
2014-08-10/20:04:18	2	1.98581	1.00000
2014-08-11/02:34:00	1	265.204	36.0000
2014-08-11/03:02:36	2	114.350	8.00000
2014-08-11/10:10:19	2	9.50000	348.000

2014-08-11/17:08:00	1	84.2137	12.0000
2014-08-11/17:08:47	2	17.9000	2164.00
2014-08-11/18:25:01	6	143.838	66.0000
2014-08-12/01:11:18	6	11.5303	29.0000
2014-08-12/06:57:41	2	6.25368	5.00000
2014-08-12/13:31:41	1	6.75071	7.00000
2014-08-13/03:26:39	1	1.17376	3.00000
2014-08-13/03:54:55	2	4492.28	0.00000
2014-08-13/17:24:16	1	4.97160	25.0000
2014-08-14/00:28:21	1	26.7415	129.000
2014-08-14/01:03:19	2	14.5038	30.0000
2014-08-14/07:38:00	1	133.248	19.0000
2014-08-14/07:58:22	2	72.2698	3.00000
2014-08-14/15:04:06	2	5.30000	32.0000
2014-08-14/16:24:18	6	26.7415	261.000
2014-08-14/21:31:38	1	15005.6	49.0000
2014-08-14/21:57:14	2	3717.60	38.0000
2014-08-14/23:15:40	6	155.270	13.0000
2014-08-15/04:24:18	1	84.2137	59.0000
2014-08-15/04:53:18	2	12602.9	33.0000
2014-08-15/05:31:42	5	73.9000	98.0000
2014-08-15/11:32:21	1	53.2236	95.0000
2014-08-15/11:59:41	2	21.2592	61.0000
2014-08-15/20:17:38	5	12.4467	105.000
2014-08-16/10:07:19	6	31.1610	436.000
2014-08-16/15:19:21	1	16.9008	294.000
2014-08-16/16:01:00	2	1.35479	0.00000
2014-08-16/22:24:20	1	6.25368	29.0000
2014-08-16/22:57:38	2	84.2137	34.0000
2014-08-17/00:18:01	6	2630.11	0.00000
2014-08-17/14:16:01	6	195.311	154.000
2014-08-17/19:18:36	1	90.9067	103.000
2014-08-17/19:53:21	2	42.3121	67.0000
2014-08-18/02:23:58	1	3.66137	11.0000
2014-08-18/02:49:45	2	13747.6	52.0000
2014-08-18/09:26:20	1	15005.6	53.0000
2014-08-18/09:48:44	2	6845.60	44.0000
2014-08-18/16:17:57	1	1.70417	3.00000
2014-08-18/23:28:00	1	78.0135	220.000
2014-08-18/23:55:36	2	57.4536	4.00000
2014-08-19/06:11:58	1	49.3050	301.000
2014-08-19/06:48:20	2	24.7727	33.0000
2014-08-19/15:21:20	6	195.311	10.0000
2014-08-19/19:57:19	1	9.89498	33.0000
2014-08-19/21:24:29	5	1201.70	74.0000
2014-08-19/22:18:38	6	2.31401	30.0000
2014-08-20/03:10:24	1	15005.6	36.0000
2014-08-20/03:55:12	2	12602.9	32.0000
2014-08-20/04:19:59	5	180.932	1.00000
2014-08-20/05:02:19	6	143.838	135.000
2014-08-20/10:51:57	2	13.7000	1257.00
2014-08-20/12:11:58	6	26.7415	74.0000
2014-08-20/17:26:00	1	1.83961	0.00000

2014-08-20/17:49:59	2	49.3050	19.0000
2014-08-21/00:05:24	1	15005.6	45.0000
2014-08-21/00:43:48	2	5.30000	43.0000
2014-08-21/07:08:41	1	45.6749	135.000
2014-08-21/07:43:39	2	11.5303	28.0000
2014-08-21/08:27:39	5	114.350	7.00000
2014-08-21/09:00:21	6	84.2137	213.000
2014-08-21/14:49:48	2	13.7000	4673.00
2014-08-21/15:15:24	5	181.700	108.000
2014-08-21/21:21:19	1	15.6565	85.0000
2014-08-21/21:45:35	2	136.300	169.000
2014-08-21/22:55:38	6	143.838	12.0000
2014-08-22/04:09:02	1	195.311	14.0000
2014-08-22/04:45:07	2	11.6000	397.000
2014-08-22/06:01:02	6	62.0198	1512.00
2014-08-22/11:13:02	1	19.6940	70.0000
2014-08-22/11:44:39	2	123.438	0.00000
2014-08-22/12:23:18	5	78.0135	2.00000
2014-08-22/13:24:59	6	98.1317	7.00000
2014-08-22/18:19:18	1	36.3110	20.0000
2014-08-22/18:43:41	2	4.60557	4.00000
2014-08-22/20:20:40	6	105.931	1.00000
2014-08-23/01:11:21	1	16.9008	208.000
2014-08-23/01:39:01	2	16.9008	105.000
2014-08-23/03:05:18	6	78.0135	67.0000
2014-08-23/09:56:19	6	973.203	0.00000
2014-08-23/22:18:20	1	84.2137	80.0000
2014-08-23/22:45:39	2	4057.60	42.0000
2014-08-23/23:58:36	6	26.7415	719.000
2014-08-24/05:18:39	1	133.248	4.00000
2014-08-24/06:58:40	6	2.69644	5.00000
2014-08-24/11:58:41	1	2.14364	9.00000
2014-08-24/12:37:30	2	6845.60	41.0000
2014-08-24/13:22:21	5	57.4536	7.00000
2014-08-24/19:43:26	2	9.50000	83.0000
2014-08-24/20:37:50	5	5.30000	36.0000
2014-08-25/03:26:16	5	180.932	3.00000
2014-08-25/09:35:56	2	20.0000	651.000
2014-08-25/10:20:45	5	80.6000	106.000
2014-08-25/16:00:16	1	295.000	62.0000
2014-08-25/18:17:01	6	309.034	27.0000
2014-08-25/22:52:21	1	14.5038	81.0000
2014-08-26/01:26:21	6	1.98581	2.00000
2014-08-26/07:22:37	5	6845.60	44.0000
2014-08-26/12:52:54	1	11548.9	62.0000
2014-08-26/13:40:55	2	3.20000	54.0000
2014-08-26/14:16:07	5	7.40000	45.0000
2014-08-26/15:09:21	6	8.49158	22.0000
2014-08-26/20:43:06	2	11.6000	1331.00
2014-08-26/21:15:07	5	2629.70	55.0000
2014-08-26/22:10:00	6	2.31401	4.00000
2014-08-27/02:58:59	1	5.36673	9.00000
2014-08-27/04:22:19	5	45.6749	108.000

2014-08-27/11:57:19	6	14.5038	78.0000
2014-08-27/17:44:47	2	36.8000	36.0000
2014-08-27/18:16:47	5	193.000	47.0000
2014-08-27/23:45:41	1	210.834	47.0000
2014-08-28/01:22:42	5	1859.00	55.0000
2014-08-28/02:13:55	6	15005.6	41.0000
2014-08-28/06:51:41	1	123.438	63.0000
2014-08-28/08:56:40	6	286.282	53.0000
2014-08-28/13:56:58	1	42.3121	284.000
2014-08-28/14:34:09	2	47.8000	60.0000
2014-08-28/15:15:45	5	15005.6	56.0000
2014-08-28/15:59:56	6	1.83961	6.00000
2014-08-28/20:46:01	1	84.2137	251.000
2014-08-28/21:44:18	2	39.1969	35.0000
2014-08-28/22:12:18	5	26.7415	48.0000
2014-08-28/23:07:42	6	28.8668	176.000
2014-08-29/04:35:36	2	9.50000	28.0000
2014-08-29/05:17:12	5	102.300	89.0000
2014-08-29/06:11:18	6	33.6376	213.000
2014-08-29/20:05:20	6	2.31401	3.00000
2014-08-30/00:43:22	1	39.1969	265.000
2014-08-30/01:31:05	2	80.6000	55.0000
2014-08-30/02:19:06	5	5.30000	38.0000
2014-08-30/07:48:59	1	90.9067	409.000
2014-08-30/08:34:00	2	9.89498	8.00000
2014-08-30/09:14:59	5	195.311	10.0000
2014-08-30/10:19:38	6	133.248	237.000
2014-08-30/14:36:38	1	72.2698	76.0000
2014-08-30/15:36:28	2	87.9000	28.0000
2014-08-30/16:11:41	5	7469.00	45.0000
2014-08-30/17:12:58	6	1.17376	0.00000
2014-08-30/21:48:39	1	72.2698	300.000
2014-08-30/23:07:18	5	7.86639	29.0000
2014-08-31/00:12:40	6	26.7415	89.0000
2014-08-31/04:41:41	1	39.1969	193.000
2014-08-31/05:35:22	2	5.30000	24.0000
2014-08-31/06:52:11	6	15005.6	50.0000
2014-08-31/12:34:54	2	7.40000	20.0000
2014-08-31/20:06:26	5	646.300	89.0000
2014-08-31/20:57:38	6	2210.30	62.0000
2014-09-01/01:36:01	1	19.6940	142.000
2014-09-01/02:24:51	2	1099.70	75.0000
2014-09-01/04:04:04	7	5.30000	59.0000
2014-09-01/08:45:26	1	295.000	82.0000
2014-09-01/09:30:14	2	47.8000	49.0000
2014-09-01/10:13:01	5	1.25505	1.00000
2014-09-01/10:49:40	6	2.69644	3.00000
2014-09-01/16:26:34	2	30.9000	124.000
2014-09-01/17:01:46	5	227.000	50.0000
2014-09-01/17:59:23	6	1201.70	85.0000
2014-09-02/00:08:03	5	12.4467	60.0000
2014-09-02/01:00:02	6	39.1969	75.0000
2014-09-02/05:40:39	1	57.4536	35.0000

2014-09-02/12:10:18	1	21.2592	110.000
2014-09-02/13:31:16	2	5.30000	326.000
2014-09-02/14:03:17	5	5.30000	283.000
2014-09-02/19:35:41	1	19.6940	114.000
2014-09-02/20:28:20	2	26.7415	34.0000
2014-09-02/20:57:00	5	24.7727	142.000
2014-09-02/21:56:17	6	26.7415	182.000
2014-09-04/00:53:41	5	19.6940	29.0000
2014-09-04/07:25:43	1	17.9000	3325.00
2014-09-04/13:35:38	1	2.69644	2.00000
2014-09-04/14:21:30	2	646.300	434.000
2014-09-04/20:37:23	1	1.98581	12.0000
2014-09-04/21:24:14	2	15005.6	326.000
2014-09-05/04:52:02	5	13.4359	20.0000
2014-09-05/05:44:41	6	15.6565	154.000
2014-09-05/10:32:18	1	10.6814	53.0000
2014-09-05/11:23:48	2	1201.70	398.000
2014-09-05/11:55:48	5	13.7000	422.000
2014-09-05/12:39:19	6	6.75071	13.0000
2014-09-05/17:23:00	1	167.611	90.0000
2014-09-05/18:26:58	2	1.98581	1.00000
2014-09-05/18:48:24	5	87.9000	296.000
2014-09-05/19:39:36	6	1303.70	389.000
2014-09-06/01:25:31	2	28.3000	191.000
2014-09-06/01:57:59	5	24.7727	32.0000
2014-09-06/03:06:18	6	105.931	125.000
2014-09-06/07:14:38	1	167.611	113.000
2014-09-06/08:12:15	2	15005.6	171.000
2014-09-06/09:03:27	5	11.6000	176.000
2014-09-06/15:21:56	2	21.8000	306.000
2014-09-06/15:57:08	5	11.6000	1113.00
2014-09-06/21:32:55	1	43.8000	124.000
2014-09-06/22:11:19	2	23.8000	144.000
2014-09-07/04:31:39	1	569.786	20.0000
2014-09-07/05:24:21	2	227.590	11.0000
2014-09-07/11:18:16	1	143.838	52.0000
2014-09-07/12:17:10	2	11.6000	121.000
2014-09-07/12:58:46	5	47.8000	127.000
2014-09-07/13:49:59	6	2210.30	248.000
2014-09-07/19:12:58	2	17.9000	1125.00
2014-09-07/19:54:34	5	20.0000	577.000
2014-09-08/02:19:27	2	20.0000	107.000
2014-09-08/02:57:51	5	419.700	141.000
2014-09-08/03:53:23	6	6.75071	23.0000
2014-09-08/09:18:26	2	33.7000	887.000
2014-09-08/10:07:41	5	1134.04	1.00000
2014-09-08/10:47:20	6	195.311	73.0000
2014-09-08/15:28:22	1	36.3110	92.0000
2014-09-08/16:18:00	2	2.69644	1.00000
2014-09-08/17:47:35	6	8896.90	76.0000
2014-09-08/23:17:30	2	20.0000	59.0000
2014-09-08/23:52:42	5	33.7000	255.000
2014-09-09/07:02:25	5	465.000	104.000

2014-09-09/07:47:59	6	123.438	147.000
2014-09-09/13:13:24	2	13.7000	72.0000
2014-09-09/13:56:41	5	167.611	6.00000
2014-09-09/20:22:32	2	15.8000	4871.00
2014-09-09/20:51:20	5	4839.60	47.0000
2014-09-09/21:39:21	6	15005.6	78.0000
2014-09-10/10:22:03	2	9.50000	56.0000
2014-09-10/10:50:51	5	20.0000	910.000
2014-09-10/17:21:02	2	15005.6	54.0000
2014-09-10/18:25:03	6	2403.00	65.0000
2014-09-11/07:15:19	2	36.3110	151.000
2014-09-11/08:11:39	6	4.97160	29.0000
2014-09-11/14:16:45	2	20.0000	1797.00
2014-09-11/21:21:01	2	195.311	4.00000
2014-09-12/02:59:57	1	114.350	22.0000
2014-09-12/04:17:19	2	72.2698	478.000
2014-09-12/04:44:58	5	1.25505	3.00000
2014-09-12/05:50:21	6	1.98581	1.00000
2014-09-12/12:00:18	5	6.75071	2.00000
2014-09-12/16:48:59	1	72.2698	852.000
2014-09-12/18:11:08	2	15005.6	183.000
2014-09-12/19:26:40	6	7.28723	6.00000
2014-09-12/23:47:41	1	33.6376	115.000
2014-09-13/01:07:28	2	4839.60	163.000
2014-09-13/01:43:38	5	11.5303	16.0000
2014-09-13/07:03:59	1	2.49792	23.0000
2014-09-13/08:10:38	2	1.46247	0.00000
2014-09-13/09:31:41	6	2.49792	4.00000
2014-09-13/14:27:19	1	26.7415	463.000
2014-09-13/15:09:59	2	1.46247	0.00000
2014-09-13/15:41:55	5	771.000	202.000
2014-09-13/16:14:58	6	26.7415	366.000
2014-09-13/21:08:19	1	155.270	26.0000
2014-09-13/22:12:58	2	78.0135	6.00000
2014-09-13/22:36:41	5	11.5303	14.0000
2014-09-13/23:16:20	6	12.4467	72.0000
2014-09-14/05:08:26	2	56.9000	376.000
2014-09-14/06:25:57	6	1.98581	3.00000
2014-09-14/12:11:45	2	43.8000	396.000
2014-09-14/12:31:38	5	78.0135	4.00000
2014-09-14/18:29:20	1	33.6376	313.000
2014-09-14/19:36:59	5	53.2236	53.0000
2014-09-14/20:27:58	6	78.0135	1356.00
2014-09-15/02:04:15	2	23.8000	89.0000
2014-09-15/03:00:40	6	1.46247	12.0000
2014-09-15/09:05:54	2	56.9000	92.0000
2014-09-15/09:31:31	5	40.1000	59.0000
2014-09-15/10:32:19	6	1099.70	199.000
2014-09-15/16:39:50	5	159.000	40.0000
2014-09-15/17:24:39	6	2017.70	208.000
2014-09-15/23:10:02	2	11.6000	1273.00
2014-09-15/23:32:26	5	20.0000	81.0000
2014-09-16/00:17:14	6	6845.60	84.0000

2014-09-16/06:30:59	5	1303.70	82.0000
2014-09-16/07:25:24	6	15005.6	85.0000
2014-09-16/13:04:54	2	9.50000	190.000
2014-09-16/13:40:07	5	9.50000	57.0000
2014-09-16/14:28:07	6	918.300	119.000
2014-09-16/20:07:06	2	159.000	29.0000
2014-09-16/20:42:01	5	4492.28	8.00000
2014-09-16/21:11:18	6	4161.53	0.00000
2014-09-17/03:41:18	5	1700.30	55.0000
2014-09-17/04:24:38	6	133.248	201.000
2014-09-17/09:12:21	1	36.3110	103.000
2014-09-17/09:59:59	2	125.000	72.0000
2014-09-17/10:28:47	5	419.700	65.0000
2014-09-17/22:50:18	1	78.0135	47.0000
2014-09-17/23:54:20	2	1.17376	1.00000
2014-09-18/00:28:22	5	1009.00	49.0000
2014-09-18/01:25:59	6	7469.00	72.0000
2014-09-18/14:04:27	2	26.0000	43.0000
2014-09-18/14:55:39	5	215.700	78.0000
2014-09-18/21:09:19	2	11.6000	201.000
2014-09-18/21:41:19	5	249.700	436.000
2014-09-19/10:59:35	2	15.8000	239.000
2014-09-19/11:34:47	5	113.700	278.000
2014-09-19/12:32:24	6	646.300	386.000
2014-09-19/18:44:43	5	36.8000	57.0000
2014-09-20/01:30:54	5	1303.70	57.0000
2014-09-20/02:15:43	6	15005.6	46.0000
2014-09-20/06:47:13	1	1859.00	52.0000
2014-09-20/07:57:38	2	159.000	61.0000
2014-09-20/08:36:02	5	15.8000	72.0000
2014-09-20/09:14:26	6	73.9000	39.0000
2014-09-20/21:59:04	2	11.6000	43.0000
2014-09-20/22:27:53	5	11.6000	232.000
2014-09-20/23:06:17	6	11548.9	37.0000
2014-09-21/06:11:58	6	3.39180	22.0000
2014-09-21/11:56:58	2	84.2137	57.0000
2014-09-21/19:34:18	5	7469.00	32.0000
2014-09-22/03:02:15	6	5757.60	78.0000
2014-09-22/09:21:41	5	78.0135	14.0000
2014-09-22/10:12:39	6	123.438	32.0000
2014-09-22/14:42:21	1	15005.6	52.0000
2014-09-22/17:25:40	6	245.678	302.000
2014-09-23/05:53:01	2	11.6000	221.000
2014-09-23/14:12:49	6	4057.60	86.0000
2014-09-23/18:41:23	1	295.000	47.0000
2014-09-23/20:33:24	5	181.700	59.0000
2014-09-23/21:27:49	6	8148.90	40.0000
2014-09-24/03:22:00	5	33.6376	81.0000
2014-09-24/04:20:41	6	33.6376	158.000
2014-09-24/08:53:40	1	49.3050	231.000
2014-09-25/13:45:41	2	15.8000	4989.00
2014-09-25/20:54:17	2	13.7000	1353.00
2014-09-25/21:35:53	5	30.9000	64.0000

2014-09-26/02:20:27	1	329.000	64.0000
2014-09-26/03:30:52	2	9.50000	53.0000
2014-09-26/04:21:41	5	1.57870	0.00000
2014-09-26/05:04:16	6	3.66137	7.00000
2014-09-26/11:22:37	5	56.9000	130.000
2014-09-26/17:44:48	2	5.30000	53.0000
2014-09-26/22:49:19	1	13.4359	52.0000
2014-09-27/06:19:35	1	11.6000	66.0000
2014-09-27/07:30:00	2	5.30000	59.0000
2014-09-27/08:15:39	5	1.17376	0.00000
2014-09-27/09:08:42	6	2.91075	9.00000
2014-09-27/14:38:57	2	11.6000	38.0000
2014-09-27/15:22:20	5	488.974	3.00000
2014-09-28/05:10:01	5	1.35479	0.00000
2014-09-28/06:12:42	6	19.6940	166.000
2014-09-28/11:43:55	2	43.8000	68.0000
2014-09-28/12:12:43	5	181.700	146.000
2014-09-28/12:57:32	6	9701.60	81.0000
2014-09-28/19:08:58	5	167.611	10.0000
2014-09-28/20:20:15	6	2403.00	105.000
2014-09-29/02:08:29	5	385.700	581.000
2014-09-29/02:46:53	6	3128.30	239.000
2014-09-29/07:31:28	1	15005.6	53.0000
2014-09-29/14:04:51	1	15005.6	46.0000
2014-09-29/15:40:52	2	5.30000	22.0000
2014-09-29/22:43:20	2	13.7000	828.000
2014-09-30/10:45:50	1	714.300	503.000
2014-09-30/12:47:26	2	28.3000	74.0000
2014-09-30/13:03:27	5	15005.6	32.0000
2014-09-30/14:02:42	6	4.97160	14.0000
2014-09-30/19:40:18	2	7.40000	76.0000
2014-09-30/20:09:06	5	21.8000	49.0000
2014-10-01/02:39:18	2	9.50000	74.0000
2014-10-01/03:11:18	5	17.9000	161.000
2014-10-01/09:38:59	2	17.9000	50.0000
2014-10-01/10:07:47	5	499.000	195.000
2014-10-01/10:42:59	6	2403.00	334.000
2014-10-01/15:14:59	1	155.270	117.000
2014-10-01/16:33:58	2	272.300	28.0000
2014-10-01/17:50:47	6	3128.30	47.0000
2014-10-01/21:59:00	1	57.4536	260.000
2014-10-01/23:42:57	2	31.1610	122.000
2014-10-02/06:47:58	2	17.9000	874.000
2014-10-02/07:03:58	5	17.9000	2984.00
2014-10-02/14:09:05	5	544.300	151.000
2014-10-02/14:37:53	6	2017.70	175.000
2014-10-02/21:01:57	5	419.700	45.0000
2014-10-03/11:07:35	5	1201.70	72.0000
2014-10-03/11:49:12	6	5270.30	49.0000
2014-10-03/17:39:38	2	5.30000	43.0000
2014-10-03/18:48:39	6	1.98581	9.00000
2014-10-04/07:37:23	2	13.7000	1527.00
2014-10-04/14:27:02	2	9.50000	146.000

2014-10-04/21:32:26	2	13.7000	40.0000
2014-10-04/22:07:38	5	30.9000	144.000
2014-10-05/11:55:51	5	11.6000	52.0000
2014-10-06/01:34:54	2	9.50000	68.0000
2014-10-06/01:54:41	4	286.282	11.0000
2014-10-06/08:40:19	2	11.6000	3461.00
2014-10-06/08:59:31	5	1700.30	97.0000
2014-10-07/12:31:47	2	17.9000	1594.00
2014-10-07/12:50:59	5	1303.70	346.000
2014-10-07/18:18:41	1	3.95237	7.00000
2014-10-07/19:35:03	2	17.9000	143.000
2014-10-07/19:51:03	5	499.000	183.000
2014-10-07/20:32:39	6	1700.30	500.000
2014-10-08/02:30:50	2	11.6000	6376.00
2014-10-08/02:56:26	5	9.50000	192.000
2014-10-08/03:34:51	6	850.300	249.000
2014-10-08/16:26:35	2	15.8000	3312.00
2014-10-08/17:30:35	6	2867.70	106.000
2014-10-08/23:34:07	2	11.6000	1376.00
2014-10-08/23:56:31	5	272.300	281.000
2014-10-09/00:34:55	6	2403.00	229.000
2014-10-09/06:07:30	2	62.1000	89.0000
2014-10-09/07:37:07	6	15005.6	50.0000
2014-10-09/13:50:35	5	249.700	83.0000
2014-10-09/14:12:59	6	249.700	108.000
2014-10-09/20:24:30	2	15.8000	34.0000
2014-10-09/21:28:31	6	2210.30	329.000
2014-10-10/02:19:45	1	918.300	143.000
2014-10-10/03:51:00	5	57.4536	66.0000
2014-10-10/04:25:38	6	84.2137	896.000
2014-10-10/10:20:19	2	7.40000	73.0000
2014-10-10/10:55:31	5	159.000	79.0000
2014-10-10/11:27:31	6	646.300	54.0000
2014-10-10/17:18:14	2	7.40000	51.0000
2014-10-10/17:50:15	5	113.700	323.000
2014-10-10/18:25:27	6	329.000	53.0000
2014-10-11/00:17:14	2	26.0000	35.0000
2014-10-11/00:49:14	5	9.50000	44.0000
2014-10-11/01:40:27	6	43.8000	40.0000
2014-10-11/07:21:47	2	7.40000	92.0000
2014-10-11/07:50:35	5	5.30000	67.0000
2014-10-11/08:35:24	6	147.700	50.0000
2014-10-11/14:50:23	5	918.300	81.0000
2014-10-11/21:20:18	1	9.50000	130.000
2014-10-11/21:45:54	4	7.40000	145.000
2014-10-11/22:17:55	5	215.700	41.0000
2014-10-12/04:22:46	2	3.20000	19.0000
2014-10-12/05:39:34	6	1553.00	89.0000
2014-10-12/11:13:29	2	5.30000	36.0000
2014-10-12/11:45:29	5	3.20000	53.0000
2014-10-12/18:17:16	2	1.00000	27.0000
2014-10-12/19:14:53	6	10585.6	68.0000
2014-10-13/01:19:28	2	13.7000	3665.00

2014-10-13/15:43:39	5	102.300	48.0000
2014-10-13/16:22:03	6	2629.70	234.000
2014-10-13/22:43:10	5	95.9000	181.000
2014-10-13/23:11:59	6	4839.60	51.0000
2014-10-14/05:46:10	5	295.000	76.0000
2014-10-14/06:34:10	6	1201.70	256.000
2014-10-14/12:06:47	2	13.7000	138.000
2014-10-14/12:51:35	5	33.7000	63.0000
2014-10-14/13:30:00	6	113.700	70.0000
2014-10-14/19:16:10	2	3.20000	47.0000
2014-10-14/19:44:38	5	123.438	5.00000
2014-10-14/20:24:58	6	90.9067	1002.00
2014-10-15/02:18:54	2	11.6000	14369.0
2014-10-15/02:41:18	5	11.6000	997.000
2014-10-15/03:10:07	6	113.700	44.0000
2014-10-15/09:11:31	2	17.9000	178.000
2014-10-15/09:40:19	5	13.7000	73.0000
2014-10-15/10:18:43	6	4057.60	65.0000
2014-10-15/14:17:18	1	4.97160	8.00000
2014-10-15/17:08:55	6	1428.30	194.000
2014-10-15/23:42:50	5	15.8000	1050.00
2014-10-16/13:19:15	2	23.8000	313.000
2014-10-17/03:14:57	2	7.40000	67.0000
2014-10-17/03:34:09	5	20.0000	214.000
2014-10-17/04:22:09	6	227.000	70.0000
2014-10-17/10:49:57	5	52.1000	52.0000
2014-10-17/11:28:21	6	227.000	78.0000
2014-10-17/15:35:03	1	181.700	56.0000
2014-10-17/17:30:16	5	7.40000	35.0000
2014-10-17/18:08:40	6	646.300	459.000
2014-10-18/01:11:03	6	15005.6	93.0000
2014-10-18/07:32:27	4	5.30000	40.0000
2014-10-18/08:07:39	5	17.9000	55.0000
2014-10-18/14:35:10	5	5.30000	48.0000
2014-10-18/15:03:59	6	9.50000	42.0000
2014-10-18/21:11:55	2	3.20000	69.0000
2014-10-18/21:34:19	5	11.6000	6509.00
2014-10-18/21:56:43	6	52.1000	64.0000
2014-10-19/02:06:53	1	80.6000	50.0000
2014-10-19/04:27:43	5	3.20000	34.0000
2014-10-19/05:12:31	6	56.9000	47.0000
2014-10-20/01:10:08	2	7.40000	54.0000
2014-10-20/01:32:32	5	5.30000	56.0000
2014-10-20/02:04:32	6	13.7000	43.0000
2014-10-21/05:36:33	5	5.30000	51.0000
2014-10-21/06:21:22	6	80.6000	54.0000
2014-10-21/19:29:28	5	102.300	61.0000
2014-10-22/02:41:29	5	26.0000	52.0000
2014-10-22/03:29:30	6	52.1000	62.0000
2014-10-22/09:06:20	2	67.7000	207.000
2014-10-22/09:31:57	5	52.1000	48.0000
2014-10-22/10:23:09	6	465.000	106.000
2014-10-22/16:30:51	2	3.20000	44.0000

2014-10-23/06:26:58	5	5.30000	47.0000
2014-10-23/07:08:35	6	13.7000	41.0000
2014-10-23/13:23:18	5	9.50000	38.0000
2014-10-23/14:11:18	6	21.8000	32.0000
2014-10-23/20:28:53	5	7.40000	91.0000
2014-10-23/21:13:41	6	56.9000	69.0000
2014-10-25/00:17:15	5	9.50000	921.000
2014-10-25/01:02:03	6	601.000	237.000
2014-10-25/21:22:30	5	9.50000	110.000
2014-10-25/21:57:42	6	95.9000	44.0000
2014-10-26/04:24:53	5	3.20000	54.0000
2014-10-26/04:53:41	6	5.30000	49.0000
2014-10-26/11:21:29	5	11.6000	54.0000
2014-10-26/11:53:29	6	249.700	43.0000
2014-10-27/07:47:39	2	7.40000	61.0000
2014-10-27/08:22:51	5	43.8000	45.0000
2014-10-27/22:25:22	5	11.6000	217.000
2014-10-28/05:21:42	5	43.8000	32.0000
2014-10-28/05:50:30	6	159.000	40.0000
2014-10-28/12:24:09	5	9.50000	64.0000
2014-10-28/12:59:21	6	36.8000	62.0000
2014-10-28/18:10:20	2	9.50000	73.0000
2014-10-28/18:35:56	3	9.50000	107.000
2014-10-28/18:55:08	4	9.50000	353.000
2014-10-28/19:17:33	5	9.50000	62.0000
2014-10-28/19:59:09	6	113.700	40.0000
2014-10-29/06:49:23	1	56.9000	52.0000
2014-10-29/09:16:36	5	3.20000	44.0000
2014-10-29/16:12:33	5	3.20000	63.0000
2014-10-29/16:41:21	6	23.8000	51.0000
2014-10-29/23:46:00	6	1.35479	3.00000
2014-10-30/03:41:27	1	11548.9	47.0000
2014-10-30/06:15:04	5	7.40000	50.0000
2014-10-30/06:40:40	6	67.7000	37.0000
2014-10-30/13:11:24	5	5.30000	34.0000
2014-10-30/13:37:00	6	95.9000	40.0000
2014-10-30/20:36:03	6	3411.70	57.0000
2014-10-31/03:32:39	6	8896.90	50.0000
2014-10-31/07:39:21	1	4839.60	55.0000
2014-10-31/10:28:58	6	215.700	93.0000
2014-10-31/14:32:39	1	2.31401	6.00000
2014-10-31/17:09:18	5	21.8000	96.0000
2014-11-01/00:37:21	6	193.000	55.0000
2014-11-01/14:07:31	5	4057.60	92.0000
2014-11-01/14:23:31	6	7469.00	60.0000
2014-11-01/21:37:39	6	114.350	151.000
2014-11-02/04:06:52	5	7.40000	62.0000
2014-11-02/04:29:16	6	52.1000	63.0000
2014-11-02/11:09:09	5	80.6000	129.000
2014-11-02/15:29:00	1	11.5303	42.0000
2014-11-03/01:05:32	5	43.8000	55.0000
2014-11-03/01:27:56	6	193.000	81.0000
2014-11-03/08:07:43	5	13.7000	2140.00

2014-11-03/08:36:31	6	36.8000	56.0000
2014-11-03/15:04:19	5	2403.00	71.0000
2014-11-03/15:33:07	6	9701.60	44.0000
2014-11-03/19:36:21	1	15005.6	49.0000
2014-11-03/22:03:34	5	5.30000	37.0000
2014-11-04/02:42:33	1	7.40000	46.0000
2014-11-04/05:03:22	5	3.20000	52.0000
2014-11-04/05:32:10	6	102.300	51.0000
2014-11-07/10:00:41	5	3.20000	88.0000
2014-11-07/10:19:53	6	80.6000	68.0000
2014-11-07/14:28:40	1	7.28723	26.0000
2014-11-07/23:01:55	2	73.9000	131.000
2014-11-07/23:17:55	3	67.7000	42.0000
2014-11-07/23:40:19	4	62.1000	80.0000
2014-11-07/23:56:19	5	80.6000	96.0000
2014-11-08/11:28:25	1	15005.6	48.0000
2014-11-08/14:14:50	5	601.000	168.000
2014-11-08/18:15:24	1	771.000	827.000
2014-11-08/21:30:38	6	1009.00	296.000
2014-11-09/03:25:37	2	7.40000	40.0000
2014-11-09/03:51:13	5	28.3000	108.000
2014-11-09/04:23:13	6	499.000	641.000
2014-11-09/15:23:19	1	10585.6	53.0000
2014-11-10/05:07:55	1	2403.00	75.0000
2014-11-10/12:17:03	1	419.700	123.000
2014-11-10/14:50:40	5	11.6000	3105.00
2014-11-10/15:13:05	6	67.7000	50.0000
2014-11-10/22:12:36	5	544.300	169.000
2014-11-11/04:02:45	2	9.50000	230.000
2014-11-11/04:15:33	3	9.50000	117.000
2014-11-11/04:37:57	4	20.0000	41.0000
2014-11-11/04:50:45	5	21.8000	187.000
2014-11-11/05:09:57	6	80.6000	65.0000
2014-11-11/12:14:49	6	11548.9	52.0000
2014-11-12/02:29:36	5	3411.70	75.0000
2014-11-12/20:16:07	1	1553.00	235.000
2014-11-12/22:33:44	4	3.20000	28.0000
2014-11-12/22:46:32	5	20.0000	75.0000
2014-11-12/23:15:20	6	159.000	61.0000
2014-11-13/03:06:01	1	3.95237	18.0000
2014-11-13/05:42:52	5	17.9000	129.000
2014-11-13/06:14:52	6	136.300	57.0000
2014-11-13/19:44:51	5	147.700	54.0000
2014-11-13/20:07:15	6	918.300	182.000
2014-11-14/02:47:34	5	73.9000	74.0000
2014-11-14/03:09:58	6	1303.70	265.000
2014-11-14/08:53:33	2	3.20000	78.0000
2014-11-14/09:31:57	4	3.20000	48.0000
2014-11-14/09:41:33	5	3.20000	95.0000
2014-11-14/10:10:21	6	67.7000	65.0000
2014-11-14/14:09:35	1	544.300	194.000
2014-11-14/16:49:37	5	329.000	112.000
2014-11-14/17:12:01	6	1553.00	154.000

2014-11-15/00:09:19	5	3717.60	86.0000
2014-11-15/06:45:23	5	43.8000	68.0000
2014-11-15/07:14:11	6	2017.70	206.000
2014-11-15/13:22:14	4	9.50000	28.0000
2014-11-15/13:41:26	5	17.9000	60.0000
2014-11-15/14:07:02	6	385.700	218.000
2014-11-15/17:57:44	1	21.8000	63.0000
2014-11-15/19:40:09	2	21.8000	180.000
2014-11-15/20:05:45	3	21.8000	32.0000
2014-11-15/20:24:58	4	26.0000	109.000
2014-11-15/20:40:58	5	23.8000	85.0000
2014-11-15/21:06:34	6	714.300	349.000
2014-11-16/02:37:26	2	11.6000	64.0000
2014-11-16/03:15:51	3	17.9000	1021.00
2014-11-16/03:28:39	4	21.8000	78.0000
2014-11-16/03:41:27	5	20.0000	50.0000
2014-11-16/09:32:42	2	7.40000	53.0000
2014-11-16/10:04:42	3	5.30000	43.0000
2014-11-16/10:20:42	4	7.40000	28.0000
2014-11-16/10:36:43	5	7.40000	97.0000
2014-11-16/11:08:43	6	40.1000	56.0000
2014-11-16/17:26:22	5	5.30000	27.0000
2014-11-16/17:42:22	6	15.8000	137.000
2014-11-16/18:07:58	7	193.000	55.0000
2014-11-17/00:13:22	3	3.20000	22.0000
2014-11-17/00:22:58	4	5.30000	31.0000
2014-11-17/00:42:10	5	7.40000	72.0000
2014-11-17/01:17:22	6	56.9000	65.0000
2014-11-17/07:36:09	5	7.40000	89.0000
2014-11-17/13:59:24	3	1.00000	39.0000
2014-11-17/14:15:24	4	1.00000	51.0000
2014-11-17/14:34:37	5	3.20000	31.0000
2014-11-17/15:09:49	6	11.6000	61.0000
2014-11-17/21:27:28	4	5.30000	31.0000
2014-11-17/21:40:16	5	9.50000	59.0000
2014-11-17/22:05:53	6	102.300	54.0000
2014-11-18/03:48:35	2	9.50000	606.000
2014-11-18/04:07:48	3	9.50000	45.0000
2014-11-18/04:20:36	4	9.50000	35.0000
2014-11-18/04:36:19	5	42.3121	107.000
2014-11-18/05:13:21	6	39.1969	188.000
2014-11-18/10:49:15	2	9.50000	141.000
2014-11-18/11:11:39	3	9.50000	259.000
2014-11-18/11:24:27	4	11.6000	84.0000
2014-11-18/11:40:27	5	11.6000	163.000
2014-11-18/12:02:51	6	918.300	153.000
2014-11-18/17:31:42	2	11.6000	1680.00
2014-11-18/18:38:55	5	11.6000	69.0000
2014-11-18/19:26:55	6	601.000	150.000
2014-11-19/08:34:30	5	5.30000	44.0000
2014-11-19/09:12:54	6	159.000	51.0000
2014-11-19/14:43:53	2	13.7000	151.000
2014-11-19/15:09:29	3	11.6000	600.000

2014-11-19/15:38:17	4	13.7000	61.0000
2014-11-19/15:38:17	5	13.7000	61.0000
2014-11-19/16:07:05	6	67.7000	69.0000
2014-11-20/05:32:48	4	20.0000	2372.00
2014-11-20/06:04:49	5	181.700	92.0000
2014-11-20/11:28:19	2	13.7000	763.000
2014-11-20/11:50:43	3	17.9000	46.0000
2014-11-20/12:13:08	4	20.0000	362.000
2014-11-20/12:35:32	5	15.8000	54.0000
2014-11-20/13:01:08	6	67.7000	59.0000
2014-11-20/19:56:00	6	2630.11	0.00000
2014-11-21/02:34:37	5	9.50000	53.0000
2014-11-21/03:03:25	6	73.9000	45.0000
2014-11-21/09:37:04	5	113.700	164.000
2014-11-21/10:02:40	6	351.700	103.000
2014-11-21/13:50:10	1	1700.30	667.000
2014-11-21/23:17:59	4	15.8000	121.000
2014-11-21/23:30:47	5	26.0000	274.000
2014-11-21/23:56:23	6	329.000	61.0000
2014-11-22/04:02:01	1	1201.70	126.000
2014-11-22/06:32:27	5	13.7000	3363.00
2014-11-22/11:04:45	1	351.700	63.0000
2014-11-22/19:41:13	1	3.20000	35.0000
2014-11-22/20:32:25	5	3.20000	77.0000
2014-11-22/20:55:58	6	452.973	10.0000
2014-11-23/00:54:03	1	15005.6	53.0000
2014-11-23/03:29:00	5	39.1969	114.000
2014-11-23/03:53:39	6	72.2698	232.000
2014-11-23/10:28:07	5	9.50000	212.000
2014-11-23/10:53:43	6	329.000	181.000
2014-11-23/17:26:35	5	1303.70	37.0000
2014-11-23/17:52:11	6	2867.70	75.0000
2014-11-24/00:29:18	5	5.30000	72.0000
2014-11-24/00:55:38	6	227.590	62.0000
2014-11-24/07:26:35	5	15.8000	2536.00
2014-11-24/07:52:11	6	6845.60	69.0000
2014-11-24/11:54:37	1	1700.30	423.000
2014-11-24/14:53:51	6	1009.00	431.000
2014-11-24/18:59:21	1	78.0135	131.000
2014-11-24/20:36:18	2	20.0000	154.000
2014-11-24/21:27:30	5	13.7000	571.000
2014-11-24/21:46:42	6	227.000	120.000
2014-11-25/01:56:38	1	2.69644	21.0000
2014-11-25/11:24:23	5	1.00000	55.0000
2014-11-25/11:49:59	6	40.1000	61.0000
2014-11-25/16:08:26	1	329.000	49.0000
2014-11-25/18:45:15	6	15005.6	58.0000
2014-11-25/23:19:19	1	1.57870	8.00000
2014-11-26/05:59:20	1	309.034	32.0000
2014-11-26/08:21:54	5	21.8000	649.000
2014-11-26/08:47:30	6	95.9000	114.000
2014-11-26/15:22:19	5	1303.70	75.0000
2014-11-26/15:44:43	6	3128.30	82.0000

2014-11-26/19:53:33	1	1303.70	92.0000
2014-11-26/21:58:22	4	5.30000	27.0000
2014-11-26/22:23:59	5	7.40000	70.0000
2014-11-26/22:43:11	6	13.7000	73.0000
2014-11-27/03:21:37	1	28.3000	53.0000
2014-11-27/05:06:39	4	973.203	3.00000
2014-11-27/05:21:59	5	973.203	0.00000
2014-11-27/05:38:00	6	901.551	3.00000
2014-11-27/09:54:20	1	114.350	331.000
2014-11-27/12:19:34	5	13.7000	3664.00
2014-11-27/12:38:46	6	40.1000	165.000
2014-11-27/19:04:09	4	7.40000	69.0000
2014-11-27/19:23:21	5	11.6000	201.000
2014-11-28/02:37:49	6	3128.30	107.000
2014-11-28/07:00:31	1	6279.00	182.000
2014-11-28/08:30:08	2	215.700	76.0000
2014-11-28/09:18:08	5	2867.70	177.000
2014-11-28/09:40:32	6	4431.60	1158.00
2014-11-28/16:02:35	4	5.30000	45.0000
2014-11-28/16:15:23	5	9.50000	66.0000
2014-11-28/21:20:20	1	5.79326	26.0000
2014-11-28/23:17:03	5	36.8000	346.000
2014-11-28/23:36:15	6	601.000	139.000
2014-11-29/03:52:17	1	15005.6	21.0000
2014-11-29/06:16:18	4	215.700	213.000
2014-11-29/06:38:42	5	419.700	59.0000
2014-11-29/11:05:20	1	3571.31	0.00000
2014-11-29/13:16:38	5	360.108	7.00000
2014-11-29/20:00:23	4	21.8000	1041.00
2014-11-29/20:16:23	5	17.9000	4026.00
2014-11-29/20:35:35	6	3128.30	344.000
2014-11-30/01:00:18	1	28.8668	232.000
2014-11-30/03:16:40	5	1426.49	0.00000
2014-11-30/07:53:33	1	3128.30	136.000
2014-11-30/09:29:34	3	7.40000	55.0000
2014-11-30/09:45:34	4	9.50000	681.000
2014-11-30/09:58:22	5	7.40000	75.0000
2014-11-30/17:32:59	6	11.5303	27.0000
2014-11-30/22:11:40	1	5757.60	391.000
2014-12-01/00:13:38	5	227.590	32.0000
2014-12-01/07:11:58	4	21.2592	254.000
2014-12-01/07:35:20	5	33.6376	318.000
2014-12-01/11:53:20	1	7.28723	72.0000
2014-12-01/14:33:18	6	114.350	1926.00
2014-12-01/18:55:40	1	22.9488	568.000
2014-12-01/21:14:38	5	3128.30	334.000
2014-12-01/21:31:40	6	2436.47	0.00000
2014-12-02/04:12:40	5	488.974	5.00000
2014-12-02/04:30:01	6	286.282	32.0000
2014-12-02/11:08:25	5	295.000	1179.00
2014-12-02/11:30:49	6	601.000	148.000
2014-12-02/15:55:39	1	3128.30	272.000
2014-12-02/18:10:05	6	2210.30	62.0000

2014-12-02/23:08:40	1	1.17376	0.00000
2014-12-03/08:02:28	1	15005.6	70.0000
2014-12-03/08:07:36	5	72.2698	325.000
2014-12-03/08:31:38	6	114.350	92.0000
2014-12-03/15:24:19	6	333.595	16.0000
2014-12-03/22:07:49	5	4057.60	60.0000
2014-12-03/22:27:18	6	8.49158	24.0000
2014-12-04/02:58:03	1	2.91075	4.00000
2014-12-04/04:00:08	2	15005.6	60.0000
2014-12-04/04:19:20	3	15005.6	31.0000
2014-12-04/04:38:32	4	15005.6	23.0000
2014-12-04/05:33:59	6	569.786	22.0000
2014-12-04/18:09:43	2	11.6000	840.000
2014-12-04/18:35:19	3	13.7000	2083.00
2014-12-04/18:48:07	4	13.7000	1482.00
2014-12-04/19:13:43	5	15.8000	6027.00
2014-12-04/23:44:40	1	4.97160	5.00000
2014-12-05/01:04:58	2	20.0000	164.000
2014-12-05/01:17:46	3	23.8000	40.0000
2014-12-05/01:52:59	4	26.0000	78.0000
2014-12-05/02:08:59	5	87.9000	91.0000
2014-12-05/06:44:29	1	15005.6	134.000
2014-12-05/07:58:06	2	3.20000	110.000
2014-12-05/08:17:18	3	3.20000	39.0000
2014-12-05/08:36:30	4	5.30000	32.0000
2014-12-05/08:52:30	5	3.20000	35.0000
2014-12-05/09:27:42	6	43.8000	132.000
2014-12-05/15:52:49	4	3.20000	47.0000
2014-12-05/16:02:25	5	5.30000	40.0000
2014-12-05/16:31:13	6	601.000	209.000
2014-12-05/20:33:18	1	8.49158	8.00000
2014-12-05/22:03:16	2	5.30000	96.0000
2014-12-05/23:04:05	5	17.9000	232.000
2014-12-05/23:29:41	6	3717.60	552.000
2014-12-06/13:28:39	6	113.700	66.0000
2014-12-06/20:28:10	6	181.700	342.000
2014-12-07/01:52:38	2	1.00000	71.0000
2014-12-07/02:11:51	3	3.20000	56.0000
2014-12-07/02:37:27	4	3.20000	31.0000
2014-12-07/03:06:15	5	5.30000	87.0000
2014-12-07/07:31:05	1	113.700	107.000
2014-12-07/08:44:42	2	11.6000	264.000
2014-12-07/10:23:18	6	9.16646	23.0000
2014-12-07/15:57:52	2	11.6000	296.000
2014-12-07/17:01:53	5	9.50000	60.0000
2014-12-07/17:24:17	6	2629.70	351.000
2014-12-07/21:33:07	1	4839.60	60.0000
2014-12-08/00:03:33	5	113.700	90.0000
2014-12-08/00:20:38	6	105.931	920.000
2014-12-08/04:55:03	1	87.9000	113.000
2014-12-08/06:08:40	2	17.9000	455.000
2014-12-08/06:21:28	3	15.8000	299.000
2014-12-08/06:34:16	4	20.0000	35.0000

2014-12-08/07:03:04	5	15.8000	15300.0
2014-12-08/07:25:28	6	80.6000	230.000
2014-12-08/14:26:01	6	714.300	229.000
2014-12-08/18:38:51	1	1553.00	66.0000
2014-12-08/21:25:17	6	918.300	358.000
2014-12-09/01:51:11	1	5757.60	152.000
2014-12-09/04:18:24	6	15005.6	183.000
2014-12-09/11:16:43	6	1.25505	1.00000
2014-12-09/15:43:36	1	3.20000	39.0000
2014-12-09/18:20:25	6	544.300	108.000
2014-12-09/22:39:39	1	3128.30	85.0000
2014-12-09/23:50:04	2	15.8000	60.0000
2014-12-10/01:19:40	6	601.000	122.000
2014-12-10/05:48:03	1	22.9488	158.000
2014-12-10/06:59:11	2	3717.60	31.0000
2014-12-10/07:18:23	3	3128.30	48.0000
2014-12-10/07:31:12	4	2867.70	29.0000
2014-12-10/08:00:00	5	5270.30	122.000
2014-12-10/08:19:12	6	15005.6	113.000
2014-12-10/14:52:36	5	19.6940	142.000
2014-12-10/15:16:19	6	31.1610	210.000
2014-12-10/20:55:08	2	9.50000	50.0000
2014-12-10/21:55:57	5	15.8000	343.000
2014-12-10/22:15:21	6	72.2698	2110.00
2014-12-11/02:47:27	1	62.1000	140.000
2014-12-11/04:29:52	4	87.9000	50.0000
2014-12-11/04:52:16	5	181.700	145.000
2014-12-11/05:14:40	6	2403.00	1488.00
2014-12-11/10:57:25	2	9.50000	74.0000
2014-12-11/11:16:37	3	11.6000	114.000
2014-12-11/11:51:49	5	7.40000	53.0000
2014-12-11/12:17:25	6	102.300	91.0000
2014-12-12/06:29:59	1	1.83961	5.00000
2014-12-12/07:45:57	2	28.3000	166.000
2014-12-12/08:56:21	5	80.6000	77.0000
2014-12-12/23:23:57	6	8896.90	52.0000
2014-12-13/03:21:03	1	15005.6	56.0000
2014-12-13/05:41:52	4	7.40000	58.0000
2014-12-13/05:54:40	5	11.6000	318.000
2014-12-13/06:17:04	6	215.700	68.0000
2014-12-13/10:31:40	1	3.95237	7.00000
2014-12-13/11:50:11	2	13747.6	84.0000
2014-12-13/12:09:23	3	15005.6	25.0000
2014-12-13/12:28:36	4	15005.6	31.0000
2014-12-13/12:54:12	5	15005.6	121.000
2014-12-13/13:17:19	6	12.4467	61.0000
2014-12-13/20:13:09	6	181.700	68.0000
2014-12-14/02:56:25	5	26.0000	195.000
2014-12-14/03:22:01	6	159.000	58.0000
2014-12-14/07:22:19	1	87.9000	141.000
2014-12-14/08:29:32	2	3.20000	119.000
2014-12-14/09:04:44	3	9.50000	304.000
2014-12-14/09:17:32	4	9.50000	807.000

2014-12-14/10:18:20	6	227.000	351.000
2014-12-14/15:45:13	2	20.0000	501.000
2014-12-14/16:04:25	3	28.3000	48.0000
2014-12-14/16:23:37	4	23.8000	38.0000
2014-12-14/16:55:37	5	30.9000	74.0000
2014-12-14/17:21:13	6	1700.30	118.000
2014-12-14/21:30:51	1	4431.60	115.000
2014-12-14/23:06:52	3	15.8000	277.000
2014-12-14/23:26:38	4	31.1610	51.0000
2014-12-14/23:53:22	5	28.8668	88.0000
2014-12-15/00:15:40	6	66.9489	205.000
2014-12-15/05:40:57	2	13.7000	1190.00
2014-12-15/06:54:33	5	11.6000	73.0000
2014-12-15/07:13:45	6	5270.30	105.000
2014-12-15/13:44:13	5	3.20000	34.0000
2014-12-15/14:13:01	6	73.9000	61.0000
2014-12-15/19:33:04	2	5.30000	38.0000
2014-12-15/19:55:28	3	5.30000	34.0000
2014-12-15/20:17:52	4	7.40000	33.0000
2014-12-15/20:46:40	5	11.6000	38.0000
2014-12-15/21:12:16	6	47.8000	71.0000
2014-12-16/01:31:57	1	57.4536	92.0000
2014-12-16/03:49:24	5	7.40000	120.000
2014-12-16/09:45:11	2	7.40000	77.0000
2014-12-16/10:01:11	3	13.7000	396.000
2014-12-16/10:20:23	4	9.50000	2178.00
2014-12-16/10:45:59	5	15.8000	377.000
2014-12-16/11:14:47	6	113.700	71.0000
2014-12-16/15:30:49	1	4431.60	57.0000
2014-12-16/16:38:02	2	7.40000	64.0000
2014-12-16/18:10:51	6	6279.00	70.0000
2014-12-16/23:43:42	2	11.6000	130.000
2014-12-17/00:04:42	3	28.8668	22.0000
2014-12-17/00:20:38	4	26.7415	10.0000
2014-12-17/00:42:00	5	22.9488	232.000
2014-12-17/01:12:37	6	39.1969	180.000
2014-12-17/05:23:29	1	4431.60	150.000
2014-12-17/07:18:42	4	3.20000	57.0000
2014-12-17/08:09:54	6	12602.9	101.000
2014-12-17/13:39:51	2	15.8000	2739.00
2014-12-17/14:02:15	3	17.9000	243.000
2014-12-17/14:15:03	4	17.9000	597.000
2014-12-17/14:47:03	5	20.0000	132.000
2014-12-17/15:09:27	6	23.8000	84.0000
2014-12-17/19:24:40	1	13.4359	58.0000
2014-12-17/22:08:43	6	249.700	90.0000
2014-12-18/02:44:13	1	15005.6	67.0000
2014-12-18/03:48:14	2	1700.30	70.0000
2014-12-18/05:12:01	6	9.89498	24.0000
2014-12-18/09:08:00	1	39.1969	589.000
2014-12-18/11:10:10	3	11.6000	645.000
2014-12-18/11:19:46	4	11.6000	1214.00
2014-12-18/11:42:10	5	15.8000	3468.00

2014-12-18/12:04:34	6	73.9000	265.000
2014-12-18/18:41:50	5	9.50000	121.000
2014-12-18/19:07:26	6	21.8000	105.000
2014-12-18/23:36:01	1	30.9000	81.0000
2014-12-19/01:44:02	5	11.6000	115.000
2014-12-19/02:03:14	6	28.3000	112.000
2014-12-19/09:03:01	5	15005.6	175.000
2014-12-19/15:24:10	4	26.0000	442.000
2014-12-19/15:43:22	5	33.7000	152.000
2014-12-19/20:30:20	1	90.9067	146.000
2014-12-19/22:17:01	4	11.6000	1120.00
2014-12-19/22:33:02	5	13.7000	988.000
2014-12-19/23:01:50	6	47.8000	123.000
2014-12-20/10:36:18	1	2.49792	9.00000
2014-12-20/11:50:28	2	215.700	196.000
2014-12-20/12:00:04	3	215.700	81.0000
2014-12-20/12:19:17	4	159.000	82.0000
2014-12-20/12:41:41	5	181.700	1354.00
2014-12-20/13:00:53	6	499.000	563.000
2014-12-20/18:46:56	2	11.6000	391.000
2014-12-20/18:59:44	3	13.7000	431.000
2014-12-20/19:18:56	4	11.6000	2540.00
2014-12-20/19:41:20	5	23.8000	2088.00
2014-12-20/20:00:32	6	87.9000	119.000
2014-12-21/02:43:32	5	21.8000	146.000
2014-12-21/03:01:18	6	3064.79	1.00000
2014-12-21/07:24:40	1	72.2698	71.0000
2014-12-21/08:45:43	2	47.8000	117.000
2014-12-21/09:04:55	3	67.7000	63.0000
2014-12-21/09:20:55	4	113.700	72.0000
2014-12-21/09:36:55	5	125.000	165.000
2014-12-21/09:59:19	6	419.700	278.000
2014-12-21/16:39:40	5	87.9000	319.000
2014-12-21/16:58:52	6	601.000	116.000
2014-12-21/21:27:43	1	11548.9	163.000
2014-12-21/23:13:19	4	7.40000	51.0000
2014-12-21/23:35:44	5	9.50000	1008.00
2014-12-21/23:58:08	6	40.1000	183.000
2014-12-22/06:09:52	4	3.20000	54.0000
2014-12-22/06:38:40	5	7.40000	93.0000
2014-12-22/07:04:16	6	918.300	503.000
2014-12-22/11:42:21	1	2.49792	2.00000
2014-12-22/12:59:31	3	3.20000	33.0000
2014-12-22/13:15:32	4	5.30000	44.0000
2014-12-22/13:37:56	5	5.30000	74.0000
2014-12-22/13:57:08	6	17.9000	55.0000
2014-12-22/18:25:58	1	20.0000	61.0000
2014-12-22/20:37:11	5	15.8000	2488.00
2014-12-22/20:53:11	6	28.3000	76.0000
2014-12-24/05:42:59	1	210.834	2.00000
2014-12-24/14:18:26	4	9.50000	77.0000
2014-12-24/14:34:26	5	28.3000	77.0000
2014-12-24/21:30:30	5	15.8000	1630.00

2014-12-25/02:31:20	1	4057.60	55.0000
2014-12-25/04:29:45	5	102.300	97.0000
2014-12-25/04:45:45	6	329.000	134.000
2014-12-25/09:37:32	1	1009.00	1794.00
2014-12-25/11:19:57	5	5.30000	57.0000
2014-12-25/11:30:18	6	4.60557	15.0000
2014-12-25/11:46:38	7	5.79326	28.0000
2014-12-25/18:29:04	5	87.9000	89.0000
2014-12-25/18:51:28	6	181.700	313.000
2014-12-25/23:25:58	1	114.350	204.000
2014-12-26/01:47:32	6	2867.70	118.000
2014-12-26/06:29:26	1	13747.6	46.0000
2014-12-26/07:39:51	2	181.700	57.0000
2014-12-26/07:46:15	3	193.000	33.0000
2014-12-26/08:18:15	4	23.8000	3321.00
2014-12-26/08:27:51	5	36.8000	54.0000
2014-12-26/08:50:15	6	193.000	44.0000
2014-12-26/13:44:58	1	15005.6	130.000
2014-12-26/14:39:22	2	1201.70	205.000
2014-12-26/15:27:23	5	87.9000	313.000
2014-12-26/15:46:35	6	193.000	192.000
2014-12-26/22:30:14	5	11.6000	77.0000
2014-12-26/22:49:26	6	43.8000	78.0000
2014-12-27/05:26:18	6	67.7000	1463.00
2014-12-27/05:48:42	7	193.000	59.0000
2014-12-27/10:36:01	1	11.5303	77.0000
2014-12-27/10:35:00	2	28.8668	125.000
2014-12-27/11:28:13	3	15005.6	89.0000
2014-12-27/12:25:49	6	125.000	265.000
2014-12-27/19:28:36	6	15.8000	231.000
2014-12-28/00:26:15	1	95.9000	49.0000
2014-12-28/02:27:52	5	26.0000	123.000
2014-12-28/09:24:11	5	193.000	206.000
2014-12-28/16:23:54	5	1099.70	137.000
2014-12-28/16:43:06	6	4431.60	324.000
2014-12-28/21:27:57	1	15005.6	148.000
2014-12-28/23:07:09	4	7.40000	85.0000
2014-12-28/23:19:58	5	9.50000	93.0000
2014-12-28/23:39:10	6	249.700	243.000
2014-12-29/06:00:28	4	7.40000	52.0000
2014-12-29/06:22:52	5	11.6000	136.000
2014-12-29/06:42:04	6	30.9000	66.0000
2014-12-29/12:34:07	2	3.20000	32.0000
2014-12-29/12:43:43	3	3.20000	27.0000
2014-12-29/12:59:43	4	3.20000	30.0000
2014-12-29/13:25:20	5	5.30000	45.0000
2014-12-30/10:27:14	5	7.40000	66.0000
2014-12-30/10:43:14	6	11.6000	65.0000
2014-12-30/15:18:29	1	7.40000	55.0000
2014-12-30/16:22:21	2	773.685	0.00000
2014-12-30/16:28:58	3	615.070	1.00000
2014-12-30/17:01:40	4	3.95237	0.00000
2014-12-30/17:18:01	5	3.95237	5.00000

```
2014-12-30/17:37:43       6      9.89498      92.0000
2014-12-30/22:24:38       1      1.46247      4.00000
2014-12-30/23:21:45       2      3411.70      42.0000
2014-12-30/23:40:57       3      3411.70      34.0000
2014-12-31/00:19:21       5      4057.60      40.0000
2014-12-31/00:38:33       6      9701.60      52.0000
2014-12-31/05:14:04       1      15005.6      85.0000
2014-12-31/06:55:18       4      133.248      5.00000
2014-12-31/07:20:58       5      133.248      21.0000
2014-12-31/07:43:20       6      195.311      110.000
2014-12-31/13:21:06       2      15.8000      254.000
2014-12-31/13:49:54       3      11.6000      1285.00
2014-12-31/13:59:30       4      15.8000      1026.00
2014-12-31/14:21:54       5      26.0000      75.0000
2014-12-31/14:41:06       6      249.700      78.0000
```

A-2 List of Plasma Boundaries 2015

```
# CCATi boundary location file: time bndnum yvalue zvalue
2015-01-01/02:38:16       1      15005.6      54.0000
2015-01-01/03:16:41       2      15005.6      57.0000
2015-01-01/03:32:41       3      136.300      31.0000
2015-01-01/04:07:53       4      9.50000      529.000
2015-01-01/04:20:41       5      7.40000      43.0000
2015-01-01/04:46:17       6      7.40000      61.0000
2015-01-01/09:25:00       1      1700.30      4497.00
2015-01-01/10:16:12       2      181.700      243.000
2015-01-01/10:41:49       3      56.9000      262.000
2015-01-01/11:04:13       4      23.8000      371.000
2015-01-01/11:13:49       5      20.0000      791.000
2015-01-01/11:42:37       6      13.7000      206.000
2015-01-01/17:16:39       2      24.7727      221.000
2015-01-01/18:16:40       4      10585.6      48.0000
2015-01-01/18:03:52       4      1.00000      30.0000
2015-01-01/23:20:27       1      15005.6      58.0000
2015-01-02/00:21:15       2      3128.30      25.0000
2015-01-02/00:43:39       3      1700.30      21.0000
2015-01-02/00:59:39       4      918.300      35.0000
2015-01-02/01:18:52       5      295.000      52.0000
2015-01-02/01:38:04       6      295.000      71.0000
2015-01-02/06:07:26       1      23.8000      88.0000
2015-01-02/07:24:15       2      7.40000      106.000
2015-01-02/07:46:39       3      3.20000      28.0000
2015-01-02/08:05:51       4      3.20000      30.0000
2015-01-02/08:18:39       5      3.20000      107.000
2015-01-02/08:41:03       6      3.20000      125.000
2015-01-02/14:23:50       2      11.6000      196.000
2015-01-02/14:49:26       3      7.40000      38.0000
2015-01-02/15:22:20       5    -0.901591          NaN
2015-01-02/15:39:00       6    -0.986550          NaN
```

2015-01-02/20:25:29	1	329.000	70.0000
2015-01-02/21:23:05	2	52.1000	400.000
2015-01-02/21:39:05	3	28.3000	50.0000
2015-01-02/21:51:53	4	17.9000	3660.00
2015-01-02/22:14:18	5	11.6000	782.000
2015-01-02/22:39:54	6	20.0000	51.0000
2015-01-03/03:28:00	1	10.6814	15.0000
2015-01-03/04:25:49	2	15005.6	252.000
2015-01-03/04:38:37	3	11.6000	1041.00
2015-01-03/04:57:49	4	9.50000	424.000
2015-01-03/05:13:49	5	5.30000	321.000
2015-01-03/05:36:13	6	5.30000	153.000
2015-01-03/11:07:19	2	26.7415	108.000
2015-01-03/12:16:59	4	18.2440	169.000
2015-01-03/12:40:58	5	10.6814	20.0000
2015-01-03/17:23:55	1	714.300	1092.00
2015-01-03/18:18:19	2	52.1000	133.000
2015-01-03/18:31:07	3	15.8000	155.000
2015-01-03/19:03:08	4	7.40000	27.0000
2015-01-03/19:12:44	5	5.30000	109.000
2015-01-03/19:35:08	6	4839.60	258.000
2015-01-04/01:15:38	2	13.4359	24.0000
2015-01-04/01:26:41	3	9.89498	4.00000
2015-01-04/01:47:39	4	6.75071	1.00000
2015-01-04/02:14:59	5	4.97160	0.00000
2015-01-04/02:41:38	6	4.26649	21.0000
2015-01-04/07:08:41	1	42.3121	185.000
2015-01-04/08:21:21	2	6.25368	10.0000
2015-01-04/08:37:58	3	3.39180	1.00000
2015-01-04/08:59:00	4	2.31401	0.00000
2015-01-04/09:13:40	5	1.98581	5.00000
2015-01-04/09:39:03	6	1.70417	0.00000
2015-01-04/14:02:41	1	2.49792	1.00000
2015-01-04/15:10:07	2	7469.00	53.0000
2015-01-04/15:58:07	4	11.6000	371.000
2015-01-04/16:10:55	5	9.50000	37.0000
2015-01-04/16:36:31	6	9.50000	91.0000
2015-01-04/20:59:20	1	53.2236	38.0000
2015-01-04/22:03:18	2	7.86639	13.0000
2015-01-04/22:51:15	4	9.50000	488.000
2015-01-04/23:16:51	5	3.20000	121.000
2015-01-05/06:03:56	2	9.50000	852.000
2015-01-05/06:16:44	3	7.40000	81.0000
2015-01-05/11:07:20	1	0.212339	NaN
2015-01-05/12:32:59	2	0.640004	NaN
2015-01-05/12:42:19	3	0.449843	NaN
2015-01-05/12:51:19	4	0.867963	NaN
2015-01-05/13:02:59	5	0.517721	NaN
2015-01-05/13:36:20	6	0.338493	NaN
2015-01-05/18:14:58	1	36.3110	177.000
2015-01-05/19:04:51	2	15005.6	49.0000
2015-01-05/19:52:51	4	9.50000	1349.00
2015-01-05/20:02:27	5	3.20000	24.0000

2015-01-05/20:34:39	6	0.201308	NaN
2015-01-06/01:12:38	1	45.6749	189.000
2015-01-06/02:04:00	2	1.98581	1.00000
2015-01-06/02:20:22	3	9.50000	509.000
2015-01-06/02:55:35	4	7.40000	65.0000
2015-01-06/03:08:23	5	5.30000	344.000
2015-01-06/03:30:47	6	5.30000	134.000
2015-01-06/09:13:46	2	9.50000	405.000
2015-01-06/09:32:58	3	11.6000	96.0000
2015-01-06/09:42:34	4	5.30000	27.0000
2015-01-06/10:01:46	5	7.40000	90.0000
2015-01-06/10:30:34	6	5.30000	104.000
2015-01-06/15:10:59	1	33.6376	114.000
2015-01-06/16:05:39	2	1.83961	1.00000
2015-01-06/16:32:13	3	13747.6	31.0000
2015-01-06/16:48:14	4	8148.90	30.0000
2015-01-06/17:01:02	5	5757.60	36.0000
2015-01-06/17:33:02	6	4057.60	128.000
2015-01-06/22:14:00	1	39.1969	303.000
2015-01-06/23:12:41	2	1.17376	1.00000
2015-01-06/23:47:29	4	15005.6	27.0000
2015-01-07/00:06:41	5	15005.6	46.0000
2015-01-07/00:35:30	6	15005.6	66.0000
2015-01-07/05:14:19	1	45.6749	204.000
2015-01-07/06:08:42	2	3.39180	0.00000
2015-01-07/07:09:41	5	9.50000	154.000
2015-01-07/07:32:05	6	30.9000	130.000
2015-01-07/13:05:16	2	7.40000	78.0000
2015-01-07/13:37:16	3	9.50000	84.0000
2015-01-07/13:46:52	4	9.50000	170.000
2015-01-07/13:56:28	5	7.40000	30.0000
2015-01-07/14:34:52	6	5.30000	79.0000
2015-01-07/19:09:58	1	24.7727	63.0000
2015-01-07/20:46:08	4	11.6000	2554.00
2015-01-07/21:08:32	5	7.40000	190.000
2015-01-08/03:45:50	4	13.7000	4265.00
2015-01-08/04:08:14	5	9.50000	115.000
2015-01-08/09:13:01	1	45.6749	322.000
2015-01-08/10:15:03	2	4.60557	3.00000
2015-01-08/11:10:42	5	3.20000	54.0000
2015-01-08/11:29:54	6	1.00000	55.0000
2015-01-08/16:09:38	1	33.6376	79.0000
2015-01-08/17:09:25	2	11548.9	112.000
2015-01-08/18:06:18	5	13.4359	126.000
2015-01-08/18:33:38	6	12.4467	27.0000
2015-01-09/00:02:37	2	5.30000	63.0000
2015-01-09/00:31:26	3	3.20000	32.0000
2015-01-09/00:47:26	4	3.20000	40.0000
2015-01-09/01:03:26	5	3.20000	64.0000
2015-01-09/01:32:14	6	3.20000	68.0000
2015-01-09/05:53:03	1	45.6749	58.0000
2015-01-09/07:24:17	3	13.7000	448.000
2015-01-09/07:37:05	4	13.7000	2262.00

2015-01-09/08:35:41	6	62.0198	52.0000
2015-01-09/12:55:41	1	42.3121	210.000
2015-01-09/14:06:02	2	3.66137	2.00000
2015-01-09/14:28:20	3	1.57870	1.00000
2015-01-09/14:41:39	4	1.46247	0.00000
2015-01-09/15:07:59	5	1.35479	4.00000
2015-01-09/15:35:19	6	1.83961	2.00000
2015-01-09/19:55:00	1	57.4536	0.00000
2015-01-09/21:07:20	2	11.6000	186.000
2015-01-09/21:20:09	3	9.50000	74.0000
2015-01-09/22:04:57	5	13.7000	3319.00
2015-01-09/22:27:39	6	39.1969	136.000
2015-01-10/04:10:08	2	2629.70	81.0000
2015-01-10/04:32:32	3	9.50000	44.0000
2015-01-10/04:48:32	4	9.50000	417.000
2015-01-10/05:04:32	5	9.50000	4934.00
2015-01-10/05:27:40	6	39.1969	219.000
2015-01-10/10:02:37	1	33.6376	172.000
2015-01-10/11:05:39	2	2.91075	2.00000
2015-01-10/12:04:00	5	16.9008	126.000
2015-01-10/12:32:19	6	13.4359	0.00000
2015-01-10/16:55:01	1	39.1969	205.000
2015-01-10/17:59:19	2	9.50000	66.0000
2015-01-10/19:32:00	5	66.9489	56.0000
2015-01-10/23:53:58	1	49.3050	101.000
2015-01-11/00:58:50	2	1099.70	42.0000
2015-01-11/02:02:51	5	13.7000	249.000
2015-01-11/02:28:27	6	43.8000	140.000
2015-01-11/08:19:41	2	13.4359	10.0000
2015-01-11/09:05:42	5	13.7000	58.0000
2015-01-11/09:28:06	6	26.0000	62.0000
2015-01-11/13:59:00	1	31.1610	101.000
2015-01-11/15:05:39	2	4.97160	1.00000
2015-01-11/15:26:33	3	9.50000	45.0000
2015-01-11/16:05:40	5	19.6940	123.000
2015-01-11/16:29:59	6	16.9008	46.0000
2015-01-11/21:03:56	1	53.2236	565.000
2015-01-11/22:02:41	2	9.89498	25.0000
2015-01-11/22:38:53	4	9.50000	1101.00
2015-01-11/23:04:38	5	19.6940	184.000
2015-01-11/23:27:00	6	22.9488	121.000
2015-01-12/05:05:56	2	7.86639	8.00000
2015-01-12/06:04:08	5	13.7000	366.000
2015-01-12/06:26:32	6	227.000	98.0000
2015-01-12/11:07:18	1	53.2236	96.0000
2015-01-12/12:07:59	2	3.39180	7.00000
2015-01-12/13:00:12	4	11.6000	39.0000
2015-01-12/13:22:36	5	30.9000	30.0000
2015-01-12/18:10:20	1	42.3121	427.000
2015-01-12/19:05:00	2	4.60557	10.0000
2015-01-12/19:37:03	3	15005.6	20.0000
2015-01-12/19:43:27	4	15005.6	26.0000
2015-01-12/20:02:39	5	13.7000	659.000

2015-01-12/20:21:51	6	15.8000	31.0000
2015-01-13/01:06:22	1	31.1610	136.000
2015-01-13/02:04:19	2	1.17376	3.00000
2015-01-13/02:56:03	4	13747.6	38.0000
2015-01-13/03:21:39	5	15005.6	62.0000
2015-01-13/09:11:39	2	21.2592	71.0000
2015-01-13/10:21:59	6	24.7727	267.000
2015-01-13/14:57:21	1	33.6376	444.000
2015-01-13/16:09:51	2	15005.6	52.0000
2015-01-13/16:35:27	4	11.6000	1356.00
2015-01-13/16:51:28	5	7.40000	43.0000
2015-01-13/17:29:52	6	147.700	63.0000
2015-01-13/21:49:01	1	57.4536	265.000
2015-01-13/23:31:47	3	11.6000	60.0000
2015-01-13/23:57:23	5	646.300	441.000
2015-01-14/00:24:41	6	114.350	123.000
2015-01-14/04:58:22	1	33.6376	265.000
2015-01-14/06:10:58	2	9.89498	18.0000
2015-01-14/06:47:19	5	9.50000	211.000
2015-01-14/07:20:38	6	26.7415	231.000
2015-01-14/18:37:39	1	36.3110	121.000
2015-01-14/20:46:26	4	15.8000	3283.00
2015-01-14/20:59:14	5	17.9000	45.0000
2015-01-14/21:22:41	6	42.3121	110.000
2015-01-15/02:01:40	1	45.6749	64.0000
2015-01-15/03:09:19	2	5.79326	0.00000
2015-01-15/03:26:29	3	15.8000	52.0000
2015-01-15/03:32:53	4	13.7000	265.000
2015-01-15/03:58:29	5	2867.70	28.0000
2015-01-15/04:20:54	6	3411.70	55.0000
2015-01-15/09:04:59	1	42.3121	197.000
2015-01-15/10:09:18	2	19.6940	46.0000
2015-01-15/10:29:29	3	13.7000	58.0000
2015-01-15/10:42:17	4	11.6000	1466.00
2015-01-15/10:55:05	5	7.40000	32.0000
2015-01-15/11:19:22	6	24.7727	165.000
2015-01-15/17:09:50	2	30.9000	59.0000
2015-01-15/17:57:50	5	11.6000	77.0000
2015-01-15/18:17:02	6	2403.00	257.000
2015-01-15/23:00:38	1	49.3050	110.000
2015-01-16/00:09:05	2	7.40000	33.0000
2015-01-16/00:21:53	3	11.6000	102.000
2015-01-16/00:34:42	4	7.40000	34.0000
2015-01-16/00:57:06	5	17.9000	38.0000
2015-01-16/01:21:41	6	72.2698	42.0000
2015-01-16/05:58:18	1	45.6749	163.000
2015-01-16/07:05:18	2	10.6814	24.0000
2015-01-16/08:17:18	6	42.3121	127.000
2015-01-16/14:05:43	2	13.4359	73.0000
2015-01-16/14:30:44	4	11.6000	542.000
2015-01-16/14:53:08	5	9.50000	63.0000
2015-01-16/15:21:41	6	45.6749	75.0000
2015-01-16/19:59:39	1	45.6749	164.000

2015-01-16/21:07:38	2	9.16646	5.00000
2015-01-16/21:36:24	4	7.40000	31.0000
2015-01-16/21:55:36	5	13.7000	81.0000
2015-01-16/22:21:23	6	39.1969	131.000
2015-01-17/03:57:31	2	11.6000	172.000
2015-01-17/04:51:55	5	11.6000	2765.00
2015-01-17/05:16:20	6	1.25505	4.00000
2015-01-17/11:13:10	2	11.6000	139.000
2015-01-17/11:19:34	3	9.50000	87.0000
2015-01-17/11:29:10	4	7.40000	28.0000
2015-01-17/12:15:59	6	42.3121	177.000
2015-01-17/16:59:18	1	33.6376	138.000
2015-01-17/18:06:01	2	11548.9	40.0000
2015-01-17/18:50:50	4	13.7000	881.000
2015-01-17/19:13:14	5	56.9000	44.0000
2015-01-18/01:04:20	2	18.2440	67.0000
2015-01-18/01:48:41	4	18.2440	124.000
2015-01-18/14:11:01	1	24.7727	168.000
2015-01-18/15:03:40	2	9.89498	30.0000
2015-01-18/15:36:29	4	11.6000	615.000
2015-01-18/15:46:05	5	11.6000	99.0000
2015-01-18/16:08:29	6	7.40000	59.0000
2015-01-18/21:05:41	1	22.9488	101.000
2015-01-18/22:00:48	2	15.8000	191.000
2015-01-18/22:10:24	3	30.9000	71.0000
2015-01-18/22:23:13	4	21.8000	464.000
2015-01-18/22:52:01	5	21.8000	732.000
2015-01-18/23:18:59	6	1.57870	2.00000
2015-01-19/11:11:21	1	22.9488	590.000
2015-01-19/12:09:18	2	1.46247	0.00000
2015-01-19/12:18:53	3	1099.70	24.0000
2015-01-19/12:31:42	4	771.000	29.0000
2015-01-19/12:47:42	5	40.1000	731.000
2015-01-19/13:10:06	6	125.000	52.0000
2015-01-19/19:37:21	1	102.300	85.0000
2015-01-19/18:03:40	2	19.6940	99.0000
2015-01-19/19:02:01	3	4.97160	3.00000
2015-01-19/19:46:57	6	13.7000	42.0000
2015-01-19/20:09:20	7	42.3121	507.000
2015-01-20/01:05:59	1	39.1969	60.0000
2015-01-20/01:52:36	2	7.28723	2.00000
2015-01-20/02:10:41	3	1.70417	1.00000
2015-01-20/02:24:01	4	1.17376	0.00000
2015-01-20/03:07:37	6	1.98581	7.00000
2015-01-20/09:23:52	4	11.6000	14532.0
2015-01-20/09:49:28	5	11.6000	190.000
2015-01-20/10:08:40	6	1428.30	155.000
2015-01-20/15:04:01	1	31.1610	116.000
2015-01-20/15:59:41	2	15.6565	98.0000
2015-01-20/16:16:43	3	13.7000	168.000
2015-01-20/16:26:20	4	11.6000	4749.00
2015-01-20/16:45:32	5	11.6000	224.000
2015-01-20/17:04:44	6	47.8000	33.0000

2015-01-20/22:01:58	1	24.7727	418.000
2015-01-20/22:58:58	2	2.31401	7.00000
2015-01-20/23:08:37	3	1.17376	0.00000
2015-01-20/23:22:39	4	15005.6	28.0000
2015-01-20/23:41:51	5	5270.30	32.0000
2015-01-21/00:07:27	6	9701.60	36.0000
2015-01-21/05:04:00	1	33.6376	134.000
2015-01-21/05:59:46	2	13.7000	157.000
2015-01-21/06:25:23	3	9.50000	261.000
2015-01-21/06:44:35	4	11.6000	126.000
2015-01-21/07:03:47	5	17.9000	105.000
2015-01-21/12:06:20	1	22.9488	339.000
2015-01-21/13:03:00	2	1.98581	2.00000
2015-01-21/13:12:16	3	15005.6	35.0000
2015-01-21/13:25:04	4	15005.6	17.0000
2015-01-21/13:47:28	5	8896.90	70.0000
2015-01-21/14:03:28	6	8148.90	85.0000
2015-01-21/18:52:59	1	36.3110	186.000
2015-01-21/19:57:01	2	9.16646	40.0000
2015-01-21/20:37:08	5	102.300	46.0000
2015-01-21/21:04:56	6	18.2440	115.000
2015-01-22/02:05:00	1	6.25368	22.0000
2015-01-22/02:54:47	2	13.7000	754.000
2015-01-22/03:10:47	3	9.50000	26.0000
2015-01-22/03:29:59	4	9.50000	26.0000
2015-01-22/08:54:19	1	62.0198	1600.00
2015-01-22/10:29:31	4	11.6000	1205.00
2015-01-22/10:42:19	5	7.40000	295.000
2015-01-22/11:04:43	6	73.9000	196.000
2015-01-22/16:57:22	2	9.50000	35.0000
2015-01-22/17:06:58	3	7.40000	44.0000
2015-01-22/17:29:22	4	9.50000	141.000
2015-01-22/17:42:10	5	15.8000	246.000
2015-01-22/18:05:19	6	227.590	573.000
2015-01-22/22:59:42	1	57.4536	812.000
2015-01-22/23:50:13	2	15005.6	40.0000
2015-01-23/06:00:20	1	36.3110	276.000
2015-01-23/06:49:45	2	4431.60	132.000
2015-01-23/07:12:09	3	11.6000	653.000
2015-01-23/07:28:09	4	5.30000	28.0000
2015-01-23/07:40:57	5	7.40000	368.000
2015-01-23/08:03:21	6	40.1000	166.000
2015-01-23/13:49:24	2	11.6000	336.000
2015-01-23/14:15:00	3	13.7000	1414.00
2015-01-23/14:24:36	4	11.6000	1200.00
2015-01-23/14:40:36	5	9.50000	36.0000
2015-01-23/14:59:48	6	13.7000	38.0000
2015-01-23/19:59:58	1	42.3121	261.000
2015-01-23/20:57:59	2	15005.6	31.0000
2015-01-23/21:36:24	5	15.8000	19105.0
2015-01-23/21:58:48	6	62.1000	35.0000
2015-01-24/03:01:40	1	24.7727	197.000
2015-01-24/03:48:11	2	1009.00	185.000

2015-01-24/04:40:21	4	4.26649	11.0000
2015-01-24/05:03:59	5	2.31401	2.00000
2015-01-24/10:07:21	1	26.7415	473.000
2015-01-24/10:54:08	2	15005.6	50.0000
2015-01-24/11:06:56	3	11548.9	30.0000
2015-01-24/11:35:44	5	13.7000	108.000
2015-01-24/11:59:21	6	36.3110	486.000
2015-01-24/17:06:39	1	24.7727	781.000
2015-01-24/17:53:39	2	15005.6	102.000
2015-01-24/18:00:03	3	2210.30	33.0000
2015-01-24/18:12:52	4	1553.00	44.0000
2015-01-24/18:57:20	6	11.5303	61.0000
2015-01-25/00:04:58	1	19.6940	233.000
2015-01-25/00:58:01	2	1.98581	0.00000
2015-01-25/01:12:22	3	3717.60	35.0000
2015-01-25/01:25:10	4	1859.00	24.0000
2015-01-25/01:40:41	5	18.2440	137.000
2015-01-25/02:05:20	6	15.6565	110.000
2015-01-25/06:55:17	1	21.2592	440.000
2015-01-25/08:08:25	3	13.7000	77.0000
2015-01-25/08:21:13	4	15.8000	95.0000
2015-01-25/08:37:14	5	11.6000	29.0000
2015-01-25/08:56:26	6	15.8000	31.0000
2015-01-25/14:01:40	1	19.6940	71.0000
2015-01-25/14:56:40	2	1.17376	0.00000
2015-01-25/15:11:09	3	12602.9	26.0000
2015-01-25/15:23:57	4	3717.60	27.0000
2015-01-25/15:33:33	5	2210.30	29.0000
2015-01-25/15:55:57	6	15005.6	26.0000
2015-01-25/21:01:18	1	21.2592	283.000
2015-01-25/21:53:01	2	1.46247	2.00000
2015-01-25/22:32:49	5	21.8000	698.000
2015-01-25/22:55:13	6	33.7000	186.000
2015-01-26/04:04:01	1	24.7727	267.000
2015-01-26/05:36:36	4	9.89498	20.0000
2015-01-26/05:56:01	5	4.60557	8.00000
2015-01-26/10:47:18	1	39.1969	131.000
2015-01-26/11:50:05	2	3128.30	24.0000
2015-01-26/12:18:54	3	11.6000	6526.00
2015-01-26/12:28:30	4	13.7000	13272.0
2015-01-26/12:41:18	5	7.40000	32.0000
2015-01-26/12:57:18	6	11.6000	56.0000
2015-01-26/17:59:22	1	33.6376	151.000
2015-01-27/01:07:18	1	33.6376	94.0000
2015-01-27/02:11:49	3	9.50000	51.0000
2015-01-27/02:18:13	4	9.50000	216.000
2015-01-27/02:36:39	5	36.3110	48.0000
2015-01-27/03:00:38	6	49.3050	129.000
2015-01-27/08:01:38	1	18.2440	70.0000
2015-01-27/08:41:38	2	4.97160	2.00000
2015-01-27/08:55:28	3	2867.70	37.0000
2015-01-27/09:05:04	4	2210.30	35.0000
2015-01-27/09:33:52	5	1859.00	48.0000

2015-01-27/09:53:04	6	2629.70	91.0000
2015-01-27/15:03:01	1	18.2440	124.000
2015-01-27/16:23:32	4	9.50000	1726.00
2015-01-27/16:36:20	5	7.40000	155.000
2015-01-27/16:52:20	6	20.0000	141.000
2015-01-27/22:00:02	1	22.9488	189.000
2015-01-27/22:50:40	2	1.35479	0.00000
2015-01-27/23:33:21	4	22.9488	206.000
2015-01-27/23:53:38	5	24.7727	200.000
2015-01-28/05:50:40	2	13.7000	460.000
2015-01-28/06:35:28	4	11.6000	161.000
2015-01-28/06:57:36	5	98.1317	25.0000
2015-01-28/11:57:20	1	33.6376	219.000
2015-01-28/12:36:59	2	7.28723	12.0000
2015-01-28/12:43:31	3	8148.90	35.0000
2015-01-28/13:12:19	4	80.6000	25.0000
2015-01-28/13:28:20	5	26.0000	75.0000
2015-01-28/13:53:56	6	12602.9	32.0000
2015-01-28/18:50:39	1	39.1969	651.000
2015-01-28/19:47:59	2	4.26649	22.0000
2015-01-28/19:55:51	3	13.7000	73.0000
2015-01-28/20:11:51	4	11.6000	457.000
2015-01-28/20:34:15	5	13.7000	44.0000
2015-01-28/20:50:15	6	136.300	81.0000
2015-01-29/01:55:21	1	15.6565	206.000
2015-01-29/02:49:06	2	15005.6	46.0000
2015-01-29/02:58:42	3	40.1000	70.0000
2015-01-29/03:08:18	4	36.8000	61.0000
2015-01-29/03:30:42	5	15.8000	790.000
2015-01-29/03:53:06	6	159.000	48.0000
2015-01-29/08:49:58	1	18.2440	177.000
2015-01-29/09:46:58	2	1.83961	0.00000
2015-01-29/10:07:34	3	15005.6	34.0000
2015-01-29/10:17:10	4	15005.6	23.0000
2015-01-29/10:33:10	5	8148.90	45.0000
2015-01-29/10:52:22	6	12602.9	59.0000
2015-01-29/15:52:21	1	18.2440	342.000
2015-01-29/16:46:21	2	1.46247	1.00000
2015-01-29/17:03:53	3	4839.60	28.0000
2015-01-29/17:10:17	4	4431.60	29.0000
2015-01-29/17:32:41	5	1859.00	194.000
2015-01-29/17:51:54	6	15005.6	129.000
2015-01-29/23:04:00	1	31.1610	512.000
2015-01-29/23:57:08	2	2629.70	35.0000
2015-01-30/00:03:32	3	20.0000	36.0000
2015-01-30/00:13:08	4	11.6000	101.000
2015-01-30/00:25:56	5	9.50000	33.0000
2015-01-30/00:52:59	6	6.25368	13.0000
2015-01-30/05:53:03	1	12.4467	135.000
2015-01-30/07:57:38	6	49.3050	738.000
2015-01-30/13:46:28	2	13.7000	90.0000
2015-01-30/14:02:28	3	13.7000	447.000
2015-01-30/14:18:28	4	20.0000	566.000

2015-01-30/14:24:52	5	17.9000	65.0000
2015-01-30/14:54:20	6	42.3121	345.000
2015-01-31/02:00:40	1	62.0198	320.000
2015-01-31/04:20:28	4	28.3000	973.000
2015-01-31/04:59:19	5	1.17376	1.00000
2015-01-31/10:44:59	2	11.6000	364.000
2015-01-31/11:04:11	3	9.50000	117.000
2015-01-31/11:10:35	4	9.50000	59.0000
2015-01-31/11:26:35	5	9.50000	173.000
2015-01-31/11:55:00	6	24.7727	56.0000
2015-01-31/16:48:39	1	53.2236	54.0000
2015-01-31/18:25:51	5	11.6000	207.000
2015-01-31/18:51:27	6	56.9000	66.0000
2015-01-31/23:57:23	1	26.7415	105.000
2015-02-01/00:42:15	2	1.98581	1.00000
2015-02-01/01:25:28	5	7.40000	173.000
2015-02-01/01:54:16	6	1099.70	351.000
2015-02-01/06:50:19	1	49.3050	287.000
2015-02-01/07:39:55	2	125.000	69.0000
2015-02-01/07:49:31	3	11.6000	992.000
2015-02-01/08:11:56	4	9.50000	67.0000
2015-02-01/08:21:32	5	7.40000	41.0000
2015-02-01/08:51:41	6	8.49158	10.0000
2015-02-01/13:51:40	1	28.8668	102.000
2015-02-01/14:48:47	2	15005.6	23.0000
2015-02-01/15:04:47	3	2017.70	23.0000
2015-02-01/15:11:11	4	918.300	34.0000
2015-02-01/15:27:11	5	771.000	64.0000
2015-02-01/15:48:01	6	66.9489	464.000
2015-02-01/20:48:38	1	49.3050	132.000
2015-02-01/21:32:34	2	13.7000	139.000
2015-02-01/21:58:11	3	7.40000	46.0000
2015-02-01/22:14:11	4	15.8000	1835.00
2015-02-01/22:20:35	5	7.40000	73.0000
2015-02-01/22:46:11	6	73.9000	193.000
2015-02-02/03:45:20	1	62.0198	30.0000
2015-02-02/05:26:38	4	56.9000	72.0000
2015-02-02/05:45:50	5	227.000	76.0000
2015-02-02/17:45:39	1	57.4536	65.0000
2015-02-02/18:54:45	3	9.50000	39.0000
2015-02-02/19:01:09	4	7.40000	32.0000
2015-02-02/19:23:33	5	5.30000	59.0000
2015-02-02/19:49:10	6	43.8000	53.0000
2015-02-03/00:46:38	1	36.3110	374.000
2015-02-03/01:28:56	2	11.6000	130.000
2015-02-03/01:38:32	3	9.50000	174.000
2015-02-03/01:54:33	4	9.50000	139.000
2015-02-03/02:29:45	5	11.6000	110.000
2015-02-03/02:45:45	6	1201.70	212.000
2015-02-03/07:48:01	1	26.7415	132.000
2015-02-03/08:23:44	2	7.40000	65.0000
2015-02-03/09:30:56	4	20.0000	74.0000
2015-02-03/09:46:56	5	11548.9	74.0000

2015-02-04/11:43:41	1	45.6749	585.000
2015-02-04/12:24:54	2	1553.00	67.0000
2015-02-04/13:22:30	4	26.0000	125.000
2015-02-04/13:41:42	5	125.000	66.0000
2015-02-04/18:40:02	1	9.16646	7.00000
2015-02-04/20:07:22	3	3.20000	31.0000
2015-02-04/20:20:10	4	3.20000	108.000
2015-02-04/20:45:46	5	11.6000	151.000
2015-02-05/22:40:18	1	28.8668	207.000
2015-02-05/23:31:56	2	11.6000	1155.00
2015-02-05/23:57:32	3	7.40000	91.0000
2015-02-06/00:07:08	4	5.30000	44.0000
2015-02-06/00:23:08	5	9.50000	81.0000
2015-02-06/00:39:08	6	15.8000	88.0000
2015-02-06/05:41:36	1	15.6565	46.0000
2015-02-06/06:23:11	2	67.7000	165.000
2015-02-06/07:17:36	4	9.50000	141.000
2015-02-06/07:40:00	5	40.1000	132.000
2015-02-06/12:35:59	1	13.4359	40.0000
2015-02-06/13:37:18	2	9.50000	182.000
2015-02-06/13:50:06	3	9.50000	328.000
2015-02-06/13:56:30	4	7.40000	76.0000
2015-02-06/14:22:06	5	9.50000	81.0000
2015-02-06/14:38:06	6	21.8000	66.0000
2015-02-06/19:38:02	1	22.9488	132.000
2015-02-06/20:53:53	3	5.30000	21.0000
2015-02-06/21:13:06	4	5.30000	53.0000
2015-02-06/21:41:54	5	95.9000	80.0000
2015-02-07/02:44:41	1	26.7415	183.000
2015-02-07/03:57:19	4	0.906298	NaN
2015-02-07/04:41:41	6	47.8000	122.000
2015-02-07/09:39:40	1	24.7727	202.000
2015-02-07/10:29:18	2	5.30000	60.0000
2015-02-07/10:58:06	3	5.30000	23.0000
2015-02-07/11:04:30	4	5.30000	38.0000
2015-02-07/11:14:06	5	3.20000	53.0000
2015-02-07/11:39:42	6	21.8000	68.0000
2015-02-07/16:38:57	1	15005.6	139.000
2015-02-07/17:23:45	2	1.00000	123.000
2015-02-07/18:05:22	4	1.00000	43.0000
2015-02-07/18:15:19	5	0.393207	NaN
2015-02-07/23:41:58	1	7.86639	15.0000
2015-02-08/01:38:19	5	-0.313457	NaN
2015-02-08/06:24:54	1	4057.60	61.0000
2015-02-08/08:00:55	4	11.6000	90.0000
2015-02-08/08:16:55	5	5.30000	71.0000
2015-02-08/08:32:55	6	7.40000	62.0000
2015-02-08/13:35:01	1	28.8668	149.000
2015-02-08/14:34:50	2	11.6000	134.000
2015-02-08/14:47:38	3	9.50000	39.0000
2015-02-08/14:57:14	4	7.40000	40.0000
2015-02-08/15:13:14	5	7.40000	46.0000
2015-02-08/15:37:19	6	22.9488	210.000

2015-02-08/20:27:40	1	45.6749	668.000
2015-02-08/21:27:58	2	11.6000	89.0000
2015-02-08/21:34:00	3	-0.874045	NaN
2015-02-08/21:51:39	4	-0.562495	NaN
2015-02-08/22:11:19	5	0.438942	NaN
2015-02-08/22:40:19	6	0.137120	NaN
2015-02-09/03:43:59	1	12.4467	34.0000
2015-02-09/04:45:26	4	3.20000	32.0000
2015-02-09/05:04:38	5	3.20000	162.000
2015-02-09/05:36:38	6	15005.6	318.000
2015-02-09/10:40:20	1	39.1969	363.000
2015-02-09/11:49:29	4	3.20000	29.0000
2015-02-09/12:08:21	5	11.5303	124.000
2015-02-09/12:35:00	6	10.6814	96.0000
2015-02-09/17:38:01	1	21.2592	198.000
2015-02-09/18:36:13	2	20.0000	255.000
2015-02-09/18:42:37	3	11.6000	59.0000
2015-02-09/18:55:25	4	9.50000	36.0000
2015-02-09/19:08:13	5	13.7000	58.0000
2015-02-09/19:33:50	6	28.3000	44.0000
2015-02-10/00:40:19	1	49.3050	869.000
2015-02-10/01:32:32	2	601.000	59.0000
2015-02-10/01:42:09	3	193.000	35.0000
2015-02-10/01:58:09	4	113.700	45.0000
2015-02-10/02:14:09	5	62.1000	299.000
2015-02-10/02:36:33	6	329.000	457.000
2015-02-10/09:05:46	4	11.6000	60.0000
2015-02-10/09:37:46	5	62.1000	58.0000
2015-02-10/14:42:41	1	57.4536	750.000
2015-02-10/15:34:37	2	601.000	25.0000
2015-02-10/15:41:01	3	181.700	30.0000
2015-02-10/15:50:38	4	47.8000	54.0000
2015-02-10/16:06:38	5	30.9000	330.000
2015-02-10/16:32:14	6	113.700	56.0000
2015-02-11/04:39:19	1	42.3121	262.000
2015-02-11/05:30:29	2	9.50000	70.0000
2015-02-11/05:40:05	3	7.40000	37.0000
2015-02-11/05:59:17	4	7.40000	34.0000
2015-02-11/06:08:53	5	9.50000	237.000
2015-02-11/06:31:17	6	67.7000	169.000
2015-02-11/11:38:59	1	45.6749	300.000
2015-02-11/12:22:08	2	7.40000	58.0000
2015-02-11/12:38:08	3	3.20000	26.0000
2015-02-11/12:47:44	4	1.00000	35.0000
2015-02-11/13:13:20	5	1.00000	61.0000
2015-02-11/13:32:32	6	5.30000	77.0000
2015-02-11/18:35:41	1	24.7727	139.000
2015-02-11/20:11:00	5	1.00000	86.0000
2015-02-11/20:33:24	6	3.20000	110.000
2015-02-12/01:38:58	1	12.4467	30.0000
2015-02-12/02:18:39	2	0.766950	NaN
2015-02-12/03:14:20	5	-0.853918	NaN
2015-02-12/08:36:59	1	12.4467	30.0000

2015-02-12/09:24:55	2	9.50000	41.0000
2015-02-12/09:34:31	3	7.40000	28.0000
2015-02-12/09:47:20	4	5.30000	24.0000
2015-02-12/10:12:56	5	5.30000	51.0000
2015-02-12/10:38:32	6	9.50000	62.0000
2015-02-12/15:33:00	1	42.3121	145.000
2015-02-12/16:21:15	2	15005.6	42.0000
2015-02-12/16:37:15	3	3411.70	24.0000
2015-02-12/16:46:51	4	1201.70	28.0000
2015-02-12/17:12:27	5	771.000	55.0000
2015-02-12/17:34:51	6	850.300	76.0000
2015-02-12/22:37:59	1	28.8668	164.000
2015-02-13/00:08:19	4	0.733839	NaN
2015-02-13/05:34:13	1	15005.6	77.0000
2015-02-13/06:31:50	2	56.9000	124.000
2015-02-13/06:38:14	3	21.8000	43.0000
2015-02-13/06:47:50	4	15.8000	187.000
2015-02-13/07:03:50	5	13.7000	85.0000
2015-02-13/07:29:26	6	13.7000	76.0000
2015-02-13/12:37:40	1	66.9489	680.000
2015-02-13/13:43:39	3	-0.168617	NaN
2015-02-13/14:07:19	4	-0.532786	NaN
2015-02-13/14:35:00	5	0.0756573	NaN
2015-02-13/19:30:00	1	33.6376	226.000
2015-02-13/20:45:01	4	5.30000	18.0000
2015-02-13/21:26:37	6	26.0000	46.0000
2015-02-14/02:32:18	1	2.31401	1.00000
2015-02-14/03:25:21	2	136.300	53.0000
2015-02-14/03:38:09	3	28.3000	35.0000
2015-02-14/03:44:33	4	26.0000	53.0000
2015-02-14/04:06:57	5	20.0000	113.000
2015-02-14/04:26:09	6	30.9000	97.0000
2015-02-14/09:34:42	1	36.3110	220.000
2015-02-14/10:26:32	2	5.30000	45.0000
2015-02-14/10:39:20	3	11.6000	1707.00
2015-02-14/10:48:56	4	7.40000	40.0000
2015-02-14/11:01:44	5	11.6000	402.000
2015-02-14/11:30:32	6	20.0000	92.0000
2015-02-14/16:31:39	1	36.3110	631.000
2015-02-14/17:24:11	2	20.0000	273.000
2015-02-14/17:27:23	3	9.50000	50.0000
2015-02-14/18:02:36	5	7.40000	82.0000
2015-02-14/18:18:36	6	147.700	1143.00
2015-02-14/23:35:43	1	21.2592	504.000
2015-02-15/00:44:38	3	7.40000	55.0000
2015-02-15/01:27:43	5	16.9008	171.000
2015-02-15/06:42:39	1	10.6814	63.0000
2015-02-15/08:04:19	5	0.627743	NaN
2015-02-15/13:36:18	1	1.25505	0.00000
2015-02-15/14:41:59	3	0.0556646	NaN
2015-02-15/14:48:19	4	0.157816	NaN
2015-02-15/15:03:39	5	0.371754	NaN
2015-02-15/15:22:39	6	0.476541	NaN

2015-02-15/20:35:00	1	7.28723	22.0000
2015-02-15/21:15:44	2	5.30000	91.0000
2015-02-15/21:39:19	4	0.848037	NaN
2015-02-15/21:59:40	5	-0.720496	NaN
2015-02-15/22:18:00	6	-0.642711	NaN
2015-02-16/03:36:00	1	28.8668	262.000
2015-02-16/04:23:30	2	9.50000	44.0000
2015-02-16/04:29:54	3	13.7000	564.000
2015-02-16/04:39:30	4	9.50000	211.000
2015-02-16/05:05:06	5	9.50000	71.0000
2015-02-16/05:21:06	6	11.6000	65.0000
2015-02-16/10:31:01	1	26.7415	301.000
2015-02-16/11:20:53	2	7.40000	36.0000
2015-02-16/11:30:29	3	9.50000	38.0000
2015-02-16/11:43:18	4	7.40000	47.0000
2015-02-16/11:59:18	5	9.50000	36.0000
2015-02-16/12:18:30	6	15.8000	49.0000
2015-02-16/17:30:39	1	8.49158	34.0000
2015-02-16/19:02:39	4	-0.654510	NaN
2015-02-16/19:22:20	5	-0.217978	NaN
2015-02-17/01:07:08	2	23.8000	137.000
2015-02-17/01:24:40	3	-0.418519	NaN
2015-02-17/01:41:40	4	-0.306341	NaN
2015-02-17/01:59:20	5	0.721168	NaN
2015-02-17/02:20:39	6	0.459548	NaN
2015-02-17/07:36:01	1	3.95237	8.00000
2015-02-17/09:01:40	4	0.0377221	NaN
2015-02-17/09:21:20	5	-0.837226	NaN
2015-02-17/14:36:59	1	13.4359	103.000
2015-02-17/16:03:20	4	0.837078	NaN
2015-02-17/16:24:00	5	0.0360719	NaN
2015-02-17/21:36:41	1	26.7415	262.000
2015-02-17/22:40:58	4	9.50000	376.000
2015-02-17/23:00:10	5	7.40000	47.0000
2015-02-17/23:19:23	6	11.6000	47.0000
2015-02-18/04:37:19	1	22.9488	298.000
2015-02-18/05:18:06	2	5.30000	223.000
2015-02-18/05:27:42	3	5.30000	15.0000
2015-02-18/05:43:42	4	3.20000	28.0000
2015-02-18/05:59:42	5	3.20000	232.000
2015-02-18/06:22:06	6	3.20000	116.000
2015-02-18/11:35:20	1	5.79326	6.00000
2015-02-18/12:54:28	3	7.40000	60.0000
2015-02-18/13:13:40	4	13.7000	57.0000
2015-02-18/18:38:31	1	15005.6	62.0000
2015-02-18/19:16:55	2	7.40000	29.0000
2015-02-18/19:29:44	3	7.40000	31.0000
2015-02-18/19:45:44	4	3.20000	29.0000
2015-02-18/19:55:20	5	3.20000	46.0000
2015-02-18/20:14:32	6	5.30000	39.0000
2015-02-19/01:28:42	1	18.2440	222.000
2015-02-19/02:09:47	2	17.9000	125.000
2015-02-19/02:28:59	3	9.50000	60.0000

2015-02-19/03:18:20	5	0.332811	NaN
2015-02-19/08:29:20	1	33.6376	172.000
2015-02-19/09:12:46	2	5.30000	111.000
2015-02-19/09:28:47	3	11.6000	215.000
2015-02-19/09:41:35	4	9.50000	37.0000
2015-02-19/09:51:11	5	7.40000	86.0000
2015-02-19/10:16:47	6	28.3000	141.000
2015-02-19/15:29:13	1	15005.6	89.0000
2015-02-19/16:17:14	2	5.30000	46.0000
2015-02-19/16:55:38	5	3.20000	56.0000
2015-02-19/17:20:03	6	26.7415	152.000
2015-02-19/22:23:20	1	31.1610	198.000
2015-02-19/23:24:30	3	9.50000	109.000
2015-02-19/23:43:42	4	9.50000	213.000
2015-02-19/23:50:39	5	0.513477	NaN
2015-02-20/00:18:54	6	1.00000	112.000
2015-02-20/05:31:21	1	24.7727	145.000
2015-02-20/06:06:38	2	52.1000	124.000
2015-02-20/07:19:03	3	6.25368	14.0000
2015-02-20/12:31:19	1	24.7727	229.000
2015-02-20/13:07:29	2	5.30000	40.0000
2015-02-20/13:23:29	3	5.30000	20.0000
2015-02-20/13:36:18	4	7.40000	26.0000
2015-02-20/13:55:30	5	7.40000	39.0000
2015-02-20/14:17:54	6	11.6000	45.0000
2015-02-20/19:20:38	1	12.4467	35.0000
2015-02-20/20:03:33	2	1.00000	42.0000
2015-02-21/02:25:00	1	24.7727	152.000
2015-02-21/03:38:17	4	17.9000	155.000
2015-02-21/03:47:53	5	11.6000	557.000
2015-02-21/04:13:29	6	28.3000	72.0000
2015-02-21/09:30:38	1	3.95237	5.00000
2015-02-21/10:05:39	2	-0.324798	NaN
2015-02-21/11:11:19	6	13.4359	67.0000
2015-02-21/16:33:25	1	15005.6	127.000
2015-02-21/17:05:25	2	136.300	653.000
2015-02-21/18:09:26	6	3.20000	139.000
2015-02-21/23:24:57	1	10.6814	73.0000
2015-02-22/00:13:12	2	9.50000	156.000
2015-02-22/00:22:48	3	7.40000	56.0000
2015-02-22/01:10:48	6	272.300	188.000
2015-02-22/06:28:16	1	26.7415	246.000
2015-02-22/13:38:21	1	1.17376	7.00000
2015-02-22/14:16:31	2	13.7000	103.000
2015-02-22/20:35:58	1	9.89498	67.0000
2015-02-22/21:12:51	2	7.40000	30.0000
2015-02-22/21:43:39	4	0.394588	NaN
2015-02-22/22:09:00	5	0.526064	NaN
2015-02-23/03:07:01	1	15005.6	104.000
2015-02-23/04:33:26	3	9.50000	1141.00
2015-02-23/04:55:50	4	7.40000	63.0000
2015-02-23/05:23:00	5	0.929164	NaN
2015-02-23/10:17:01	1	78.0135	117.000

2015-02-23/11:45:39	3	-0.0303428	NaN
2015-02-23/12:09:30	4	3.20000	129.000
2015-02-23/17:20:39	1	1.70417	0.00000
2015-02-23/18:43:25	3	3.20000	130.000
2015-02-23/19:09:01	4	5.30000	107.000
2015-02-24/00:19:41	1	8.49158	9.00000
2015-02-24/01:04:33	2	9.50000	99.0000
2015-02-24/01:14:09	3	5.30000	36.0000
2015-02-24/01:26:57	4	5.30000	28.0000
2015-02-24/02:02:39	6	19.6940	146.000
2015-02-24/07:24:21	1	9.89498	33.0000
2015-02-24/08:24:20	4	0.998503	NaN
2015-02-24/08:46:40	5	-0.835766	NaN
2015-02-24/09:06:19	6	-0.826460	NaN
2015-02-24/14:21:18	1	8.49158	8.00000
2015-02-24/15:00:17	2	15.8000	46.0000
2015-02-24/16:06:40	5	0.632366	NaN
2015-02-24/21:21:09	1	2210.30	83.0000
2015-02-24/22:02:45	2	3.20000	44.0000
2015-02-24/22:45:59	4	-0.113477	NaN
2015-02-24/23:03:39	5	0.0797093	NaN
2015-02-25/04:20:58	1	15.6565	106.000
2015-02-25/05:27:53	3	5.30000	18.0000
2015-02-25/05:43:53	4	15.8000	747.000
2015-02-25/06:03:05	5	43.8000	123.000
2015-02-25/11:32:00	1	10.6814	35.0000
2015-02-25/12:07:00	2	13.7000	794.000
2015-02-25/12:16:36	3	9.50000	46.0000
2015-02-25/12:32:36	4	9.50000	27.0000
2015-02-25/12:58:12	6	714.300	796.000
2015-02-25/18:26:15	1	15005.6	50.0000
2015-02-25/19:26:00	3	0.781339	NaN
2015-02-25/20:04:19	5	0.345930	NaN
2015-02-26/01:23:41	1	19.6940	168.000
2015-02-26/02:20:11	3	15005.6	28.0000
2015-02-26/02:29:47	4	13.7000	1435.00
2015-02-26/02:39:23	5	11.6000	88.0000
2015-02-26/03:17:48	6	67.7000	53.0000
2015-02-26/08:25:59	1	10.6814	67.0000
2015-02-26/10:04:00	5	-0.558536	NaN
2015-02-26/15:29:40	1	9.16646	85.0000
2015-02-26/16:01:40	2	5.30000	42.0000
2015-02-26/17:02:40	6	0.379592	NaN
2015-02-26/22:27:19	1	1859.00	1452.00
2015-02-26/23:24:56	3	7.40000	22.0000
2015-02-27/00:03:20	5	73.9000	155.000
2015-02-27/05:11:59	1	6.75071	22.0000
2015-02-27/06:00:36	2	5.30000	76.0000
2015-02-27/07:11:00	5	601.000	700.000
2015-02-27/12:10:00	1	7.86639	40.0000
2015-02-27/13:01:27	2	9.50000	121.000
2015-02-27/13:27:04	4	11.6000	466.000
2015-02-27/14:05:28	6	159.000	88.0000

2015-02-27/19:07:21	1	19.6940	103.000
2015-02-28/02:14:41	1	11.5303	30.0000
2015-02-28/09:19:01	1	1.35479	0.00000
2015-02-28/10:56:10	4	9.50000	82.0000
2015-02-28/16:18:19	1	5.36673	6.00000
2015-02-28/16:53:01	2	3.20000	91.0000
2015-02-28/17:09:01	3	3.20000	26.0000
2015-02-28/17:41:02	5	17.9000	136.000
2015-02-28/18:00:14	6	73.9000	158.000
2015-02-28/23:17:01	1	13.4359	44.0000
2015-03-01/01:01:32	5	11.6000	61.0000
2015-03-01/05:53:41	1	6584.64	0.00000
2015-03-01/06:11:01	2	22.9488	80.0000
2015-03-01/06:48:47	3	11.6000	230.000
2015-03-01/07:17:36	5	7.40000	18.0000
2015-03-01/07:36:48	6	9.50000	26.0000
2015-03-01/08:08:48	7	113.700	47.0000
2015-03-01/13:11:00	1	31.1610	126.000
2015-03-01/14:13:55	3	5.30000	31.0000
2015-03-01/14:20:19	4	3.20000	26.0000
2015-03-01/14:42:43	5	5.30000	44.0000
2015-03-01/15:01:55	6	1303.70	76.0000
2015-03-01/20:12:18	1	16.9008	65.0000
2015-03-01/20:51:02	2	11.6000	592.000
2015-03-01/21:07:03	3	9.50000	190.000
2015-03-01/21:19:51	4	7.40000	32.0000
2015-03-01/21:32:39	5	9.50000	79.0000
2015-03-01/22:06:02	6	10.6814	13.0000
2015-03-02/03:12:37	1	10.6814	34.0000
2015-03-02/03:49:10	2	9.50000	70.0000
2015-03-02/04:43:34	5	9.50000	71.0000
2015-03-02/04:56:22	6	13.7000	67.0000
2015-03-02/10:12:39	1	49.3050	223.000
2015-03-02/11:41:46	5	7.40000	61.0000
2015-03-02/12:04:10	6	21.8000	49.0000
2015-03-02/17:17:38	1	9.89498	19.0000
2015-03-02/17:59:41	2	7.40000	31.0000
2015-03-02/18:34:53	4	7.40000	45.0000
2015-03-03/00:13:21	1	9.16646	11.0000
2015-03-03/00:52:49	2	13.7000	90.0000
2015-03-03/02:05:20	6	14.5038	41.0000
2015-03-03/07:19:20	1	5.79326	0.00000
2015-03-03/09:03:37	5	4.60557	19.0000
2015-03-04/04:57:32	2	9.50000	99.0000
2015-03-04/05:29:32	4	9.50000	388.000
2015-03-04/06:06:41	5	31.1610	95.0000
2015-03-04/11:09:41	1	22.9488	106.000
2015-03-04/12:33:00	3	21.8000	1485.00
2015-03-04/12:55:39	4	16.9008	75.0000
2015-03-05/01:17:23	1	1700.30	1260.00
2015-03-05/01:55:47	2	11.6000	51.0000
2015-03-05/02:27:47	4	11.6000	71.0000
2015-03-05/02:56:39	5	1.35479	3.00000

2015-03-05/08:52:07	2	11.6000	724.000
2015-03-05/09:30:31	4	15.8000	133.000
2015-03-05/09:56:07	5	4431.60	508.000
2015-03-05/15:49:28	2	11.6000	207.000
2015-03-05/16:56:59	5	62.0198	141.000
2015-03-05/22:13:40	1	2.14364	1.00000
2015-03-05/23:51:56	3	329.000	279.000
2015-03-06/06:52:26	3	1553.00	173.000
2015-03-06/12:05:18	1	62.0198	106.000
2015-03-06/12:40:13	2	11.6000	45.0000
2015-03-06/12:53:01	3	7.40000	43.0000
2015-03-06/13:02:37	4	9.50000	54.0000
2015-03-06/13:50:38	6	15005.6	49.0000
2015-03-06/20:24:33	2	7.40000	92.0000
2015-03-06/20:53:22	3	714.300	174.000
2015-03-07/02:18:38	1	9.89498	54.0000
2015-03-07/02:55:33	2	11.6000	366.000
2015-03-07/03:49:57	4	714.300	918.000
2015-03-07/09:14:24	1	159.000	167.000
2015-03-07/09:46:24	2	9.50000	165.000
2015-03-07/09:59:12	3	7.40000	135.000
2015-03-07/16:15:22	1	21.2592	72.0000
2015-03-07/16:44:51	2	11.6000	135.000
2015-03-07/17:00:51	3	9.50000	124.000
2015-03-07/17:16:52	4	9.50000	80.0000
2015-03-07/17:26:28	5	9.50000	148.000
2015-03-07/17:48:52	6	26.0000	175.000
2015-03-07/23:15:21	1	10.6814	32.0000
2015-03-07/23:48:34	2	11.6000	491.000
2015-03-08/00:01:22	3	7.40000	50.0000
2015-03-08/00:51:40	6	62.0198	134.000
2015-03-08/07:52:38	4	15.6565	21.0000
2015-03-08/13:10:59	1	24.7727	147.000
2015-03-08/14:53:30	3	2403.00	845.000
2015-03-09/04:53:44	3	272.300	52.0000
2015-03-09/11:10:36	3	5.30000	21.0000
2015-03-09/11:23:24	4	3.20000	77.0000
2015-03-09/17:54:07	2	11.6000	22.0000
2015-03-09/18:54:56	5	73.9000	44.0000
2015-03-10/08:06:52	2	9.50000	446.000
2015-03-10/14:04:01	1	4.60557	2.00000
2015-03-10/22:01:23	2	9.50000	24.0000
2015-03-10/22:07:47	3	7.40000	26.0000
2015-03-10/22:53:38	5	62.0198	250.000
2015-03-11/04:48:23	2	7.40000	46.0000
2015-03-11/05:26:47	4	3.20000	81.0000
2015-03-12/01:08:19	1	36.3110	91.0000
2015-03-12/09:43:43	2	1.00000	59.0000
2015-03-12/15:08:14	1	646.300	140.000
2015-03-12/15:43:26	2	11.6000	82.0000
2015-03-12/16:21:50	4	9.50000	53.0000
2015-03-12/22:06:41	1	227.000	388.000
2015-03-12/22:41:53	2	7.40000	118.000

2015-03-12/23:43:39	4	-0.364467	NaN
2015-03-13/06:40:04	3	1303.70	1601.00
2015-03-13/11:58:36	1	16.9008	61.0000
2015-03-13/13:38:40	3	19.6940	106.000
2015-03-13/22:53:33	1	1009.00	99.0000
2015-03-13/19:30:51	2	11.6000	33.0000
2015-03-13/22:53:33	3	5.30000	44.0000
2015-03-13/20:41:15	5	11.6000	50.0000
2015-03-14/02:43:11	2	7.40000	45.0000
2015-03-14/03:18:23	4	11.6000	87.0000
2015-03-14/03:37:35	5	56.9000	130.000
2015-03-14/09:40:22	2	3.20000	57.0000
2015-03-14/10:38:59	4	-0.907209	NaN
2015-03-14/16:05:02	1	2.31401	5.00000
2015-03-14/16:35:37	2	13.7000	442.000
2015-03-14/17:01:14	4	9.50000	182.000
2015-03-14/17:17:14	5	7.40000	111.000
2015-03-14/17:39:38	6	329.000	148.000
2015-03-14/23:00:58	1	56.9000	76.0000
2015-03-15/00:11:22	3	1.00000	57.0000
2015-03-15/06:00:21	1	9.89498	18.0000
2015-03-15/07:13:02	3	17.9000	32.0000
2015-03-15/07:38:38	4	3.20000	45.0000
2015-03-15/13:34:09	2	9.50000	62.0000
2015-03-15/14:12:33	3	11.6000	47.0000
2015-03-15/14:34:58	4	36.8000	37.0000
2015-03-15/20:07:24	1	10.6814	46.0000
2015-03-15/20:36:53	2	11.6000	116.000
2015-03-15/21:37:58	4	7.86639	11.0000
2015-03-16/04:40:20	5	16.9008	143.000
2015-03-16/10:00:31	1	3128.30	335.000
2015-03-16/10:35:43	2	9.50000	129.000
2015-03-16/11:38:21	5	2.91075	17.0000
2015-03-16/16:54:38	1	1.17376	1.00000
2015-03-16/17:28:35	2	11548.9	56.0000
2015-03-16/18:10:11	5	15.8000	82.0000
2015-03-16/18:42:12	6	193.000	65.0000
2015-03-16/23:59:34	1	465.000	499.000
2015-03-17/00:25:10	2	7.40000	167.000
2015-03-17/06:59:18	1	26.7415	68.0000
2015-03-17/13:55:39	1	3.95237	5.00000
2015-03-17/14:30:31	2	9.50000	62.0000
2015-03-17/15:34:32	4	850.300	153.000
2015-03-17/21:02:16	1	2.14364	2.00000
2015-03-17/21:36:27	2	7.40000	35.0000
2015-03-17/21:42:51	3	7.40000	20.0000
2015-03-17/22:34:04	5	2403.00	242.000
2015-03-18/04:00:30	1	850.300	2201.00
2015-03-18/05:14:07	3	11.6000	149.000
2015-03-18/05:33:19	4	15.8000	114.000
2015-03-18/17:53:11	1	11548.9	46.0000
2015-03-18/19:06:48	3	13.7000	47.0000
2015-03-19/01:02:19	1	12602.9	58.0000

2015-03-19/01:31:07	2	13.7000	1285.00
2015-03-19/08:33:51	2	1.00000	111.000
2015-03-19/09:37:51	5	272.300	524.000
2015-03-19/14:56:39	1	22.9488	170.000
2015-03-19/15:34:24	2	17.9000	82.0000
2015-03-19/16:35:12	4	3128.30	96.0000
2015-03-19/21:53:00	1	333.595	166.000
2015-03-19/22:32:51	2	9.50000	411.000
2015-03-19/23:35:01	5	18.2440	55.0000
2015-03-20/05:35:19	2	7.40000	37.0000
2015-03-20/05:44:55	3	3.20000	19.0000
2015-03-20/05:51:19	4	9.50000	281.000
2015-03-20/06:04:07	5	7.40000	35.0000
2015-03-20/11:48:43	1	18.2440	100.000
2015-03-20/12:31:39	2	11.6000	222.000
2015-03-20/13:06:51	4	9.50000	108.000
2015-03-20/13:35:39	5	646.300	701.000
2015-03-20/18:43:39	1	10.6814	110.000
2015-03-20/19:35:24	2	13.7000	1076.00
2015-03-20/19:38:36	3	5.30000	31.0000
2015-03-20/19:48:12	4	7.40000	32.0000
2015-03-20/20:27:41	6	42.3121	549.000
2015-03-21/01:53:41	1	4.97160	122.000
2015-03-21/02:34:07	2	11.6000	259.000
2015-03-22/06:07:16	1	2629.70	906.000
2015-03-22/06:23:16	2	5.30000	67.0000
2015-03-22/07:30:28	5	17.9000	70.0000
2015-03-22/12:47:59	1	1.98581	5.00000
2015-03-22/14:30:59	4	2.69644	6.00000
2015-03-22/19:46:03	1	2867.70	299.000
2015-03-22/21:25:23	6	14.5038	35.0000
2015-03-23/10:20:08	2	9.50000	325.000
2015-03-23/10:58:32	4	3.20000	82.0000
2015-03-23/11:30:32	5	3.20000	64.0000
2015-03-23/16:45:01	1	5.36673	5.00000
2015-03-23/17:42:03	3	9.50000	23.0000
2015-03-23/17:48:27	4	9.50000	22.0000
2015-03-23/23:46:20	1	3.39180	5.00000
2015-03-24/00:19:11	2	20.0000	315.000
2015-03-24/00:57:35	4	5.30000	108.000
2015-03-24/01:35:59	5	62.1000	174.000
2015-03-24/06:44:38	1	15005.6	74.0000
2015-03-24/13:40:16	1	3.14208	3.00000
2015-03-24/14:21:29	2	13.7000	786.000
2015-03-24/15:27:20	6	0.626027	NaN
2015-03-24/20:46:58	1	15.6565	88.0000
2015-03-24/21:17:49	2	9.50000	86.0000
2015-03-24/21:24:13	3	9.50000	54.0000
2015-03-24/21:30:37	4	7.40000	30.0000
2015-03-24/22:25:01	6	17.9000	48.0000
2015-03-25/03:48:32	1	329.000	179.000
2015-03-25/05:27:45	6	136.300	179.000
2015-03-25/10:52:22	1	385.700	254.000

2015-03-25/11:21:10	2	3.20000	69.0000
2015-03-25/11:30:46	3	5.30000	41.0000
2015-03-25/11:40:22	4	5.30000	32.0000
2015-03-25/11:53:10	5	5.30000	89.0000
2015-03-25/12:28:22	6	17.9000	88.0000
2015-03-25/17:46:59	1	2.91075	3.00000
2015-03-25/19:23:38	6	26.7415	160.000
2015-03-26/00:45:41	1	6.25368	9.00000
2015-03-26/01:09:00	2	0.781341	NaN
2015-03-26/01:23:40	3	-0.881876	NaN
2015-03-26/01:38:00	4	-0.929680	NaN
2015-03-26/02:24:59	6	0.784695	NaN
2015-03-26/16:26:28	6	8896.90	83.0000
2015-03-26/21:45:43	1	771.000	1233.00
2015-03-26/22:24:07	3	5.30000	88.0000
2015-03-26/22:36:56	4	7.40000	45.0000
2015-03-27/04:46:39	1	13.4359	24.0000
2015-03-27/05:12:02	2	7.40000	122.000
2015-03-27/06:24:38	6	53.2236	93.0000
2015-03-28/01:44:57	1	15005.6	100.000
2015-03-28/02:10:34	2	13.7000	720.000
2015-03-28/03:24:10	6	6279.00	179.000
2015-03-28/08:43:40	1	6.25368	11.0000
2015-03-28/09:09:01	2	7.40000	106.000
2015-03-28/10:19:26	6	8148.90	153.000
2015-03-28/15:39:01	1	72.2698	552.000
2015-03-28/16:06:27	2	7.40000	62.0000
2015-03-28/17:16:51	6	419.700	135.000
2015-03-28/23:17:43	2	5.30000	44.0000
2015-03-29/00:18:21	6	13.4359	46.0000
2015-03-29/05:45:41	1	1.17376	0.00000
2015-03-29/06:14:18	2	7.40000	94.0000
2015-03-29/06:30:18	3	11.6000	106.000
2015-03-29/06:36:42	4	11.6000	74.0000
2015-03-29/06:49:30	5	11.6000	129.000
2015-03-29/07:27:55	6	21.8000	109.000
2015-03-29/12:40:38	1	12.4467	21.0000
2015-03-29/13:49:55	5	13.7000	103.000
2015-03-29/14:25:08	6	295.000	190.000
2015-03-29/19:31:34	1	15005.6	115.000
2015-03-29/20:03:35	2	1.00000	92.0000
2015-03-29/21:29:19	6	4.26649	10.0000
2015-03-30/02:34:40	1	8.49158	36.0000
2015-03-30/03:10:34	2	9.50000	72.0000
2015-03-30/09:35:39	1	31.1610	177.000
2015-03-30/10:09:01	2	1.00000	57.0000
2015-03-30/10:31:26	3	9.50000	56.0000
2015-03-30/10:41:02	4	9.50000	38.0000
2015-03-30/11:22:38	6	3.20000	46.0000
2015-03-30/16:36:33	1	2629.70	58.0000
2015-03-31/00:04:53	2	11.6000	99.0000
2015-03-31/01:24:59	6	39.1969	180.000
2015-03-31/07:47:14	4	7.40000	57.0000

2015-03-31/08:28:21	6	2.49792	2.00000
2015-03-31/13:44:17	1	2.14364	3.00000
2015-03-31/14:39:18	5	7.40000	30.0000
2015-03-31/15:20:54	6	5757.60	51.0000
2015-03-31/21:16:25	2	7.40000	100.000
2015-03-31/21:48:25	5	7.40000	103.000
2015-03-31/22:17:14	6	249.700	84.0000
2015-04-01/04:22:21	3	5.30000	24.0000
2015-04-01/04:25:33	4	9.50000	62.0000
2015-04-01/05:16:45	6	1859.00	527.000
2015-04-01/10:44:30	1	56.9000	107.000
2015-04-01/11:19:42	3	7.40000	66.0000
2015-04-01/11:26:06	4	7.40000	34.0000
2015-04-01/12:14:06	6	15005.6	69.0000
2015-04-01/18:14:57	2	9.50000	33.0000
2015-04-02/01:08:05	2	11.6000	62.0000
2015-04-02/02:11:56	6	26.7415	172.000
2015-04-02/13:57:49	1	1.00000	110.000
2015-04-02/15:08:14	2	13.7000	212.000
2015-04-02/13:57:49	3	5.30000	111.000
2015-04-02/15:46:38	4	11.6000	49.0000
2015-04-02/15:49:50	5	13.7000	61.0000
2015-04-02/16:12:14	6	26.0000	63.0000
2015-04-02/21:29:34	1	7.86639	20.0000
2015-04-02/19:36:24	2	0.994590	NaN
2015-04-02/22:25:54	4	9.50000	73.0000
2015-04-02/22:48:18	5	9.50000	102.000
2015-04-02/23:17:06	6	80.6000	138.000
2015-04-03/03:56:49	1	3.20000	81.0000
2015-04-03/05:13:38	2	11.6000	246.000
2015-04-03/03:56:49	3	3.20000	81.0000
2015-04-03/02:35:48	4	0.000762298	NaN
2015-04-03/03:56:49	5	3.20000	81.0000
2015-04-03/06:14:26	6	9701.60	65.0000
2015-04-03/11:36:53	1	15005.6	62.0000
2015-04-03/09:35:36	2	-0.985618	NaN
2015-04-03/09:35:36	3	-0.985618	NaN
2015-04-03/12:21:41	4	7.40000	26.0000
2015-04-03/09:35:36	5	-0.985618	NaN
2015-04-03/13:19:58	6	28.8668	984.000
2015-04-04/02:09:07	2	7.40000	49.0000
2015-04-04/08:32:22	1	113.700	59.0000
2015-04-04/09:42:47	5	11.6000	47.0000
2015-04-04/10:08:23	6	329.000	165.000
2015-04-04/15:34:19	1	5.79326	2.00000
2015-04-04/16:07:06	2	1.00000	39.0000
2015-04-04/17:14:19	6	1.00000	47.0000
2015-04-04/22:31:25	1	47.8000	106.000
2015-04-04/23:06:38	2	11.6000	152.000
2015-04-05/05:31:50	1	544.300	70.0000
2015-04-05/06:07:02	2	13.7000	654.000
2015-04-05/14:06:18	6	87.9000	54.0000
2015-04-06/02:27:22	1	11.6000	80.0000

2015-04-06/04:12:58	6	1.00000	67.0000
2015-04-06/09:29:01	1	9.50000	55.0000
2015-04-06/10:10:38	2	1.00000	37.0000
2015-04-06/10:52:14	5	1.00000	55.0000
2015-04-06/16:34:41	1	714.300	1011.00
2015-04-06/17:03:29	2	9.50000	45.0000
2015-04-06/17:41:53	5	1.00000	47.0000
2015-04-07/00:41:41	5	1.00000	164.000
2015-04-07/01:04:05	6	1.00000	98.0000
2015-04-07/06:28:26	1	5.30000	73.0000
2015-04-07/07:03:38	2	1.00000	63.0000
2015-04-07/08:10:50	6	3.20000	72.0000
2015-04-07/13:30:05	1	23.8000	63.0000
2015-04-07/13:58:53	2	1.00000	45.0000
2015-04-07/15:12:30	6	1.00000	51.0000
2015-04-08/04:14:13	3	3.20000	30.0000
2015-04-08/04:20:37	4	7.40000	48.0000
2015-04-08/04:49:25	5	5.30000	101.000
2015-04-08/05:15:01	6	5.30000	105.000
2015-04-09/00:14:47	1	15005.6	58.0000
2015-04-09/01:37:59	5	13.7000	66.0000
2015-04-09/02:06:48	6	20.0000	59.0000
2015-04-09/07:20:42	1	11.6000	137.000
2015-04-09/07:55:55	2	9.50000	96.0000
2015-04-09/08:40:43	5	7.40000	88.0000
2015-04-09/09:06:19	6	11.6000	96.0000
2015-04-09/14:56:40	2	11.6000	57.0000
2015-04-09/15:41:28	5	20.0000	76.0000
2015-04-09/16:00:40	6	36.8000	67.0000
2015-04-09/21:32:43	1	20.0000	54.0000
2015-04-09/22:39:56	5	9.50000	123.000
2015-04-09/23:11:56	6	11.6000	118.000
2015-04-10/05:40:36	5	15.8000	256.000
2015-04-10/06:09:24	6	43.8000	49.0000
2015-04-10/11:25:27	1	15005.6	43.0000
2015-04-10/11:54:15	2	9.50000	39.0000
2015-04-10/13:07:52	6	87.9000	45.0000
2015-04-10/18:24:59	1	181.700	63.0000
2015-04-10/20:04:12	6	40.1000	53.0000
2015-04-11/01:16:38	1	6.25368	8.00000
2015-04-11/01:52:00	2	1.17376	1.00000
2015-04-11/08:18:32	1	9.50000	89.0000
2015-04-11/15:26:35	1	30.9000	49.0000
2015-04-11/15:55:23	2	23.8000	68.0000
2015-04-11/16:37:00	5	3.20000	41.0000
2015-04-11/17:02:36	6	13.7000	60.0000
2015-04-12/05:19:41	1	16.9008	83.0000
2015-04-12/05:46:06	2	43.8000	183.000
2015-04-12/07:06:06	6	1428.30	1199.00
2015-04-12/12:22:00	1	3.39180	34.0000
2015-04-12/12:54:09	2	1428.30	50.0000
2015-04-12/14:01:22	6	4057.60	383.000
2015-04-12/19:50:29	2	11.6000	445.000

2015-04-12/20:28:53	5	9.50000	114.000
2015-04-12/20:57:42	6	23.8000	125.000
2015-04-13/03:06:58	3	3.20000	29.0000
2015-04-13/03:13:22	4	3.20000	27.0000
2015-04-13/23:20:04	1	1.35479	3.00000
2015-04-14/08:06:01	6	26.0000	78.0000
2015-04-15/03:08:18	1	73.9000	132.000
2015-04-15/03:33:54	2	21.8000	317.000
2015-04-15/03:59:31	3	9.50000	155.000
2015-04-15/04:09:07	4	9.50000	186.000
2015-04-15/04:28:19	5	9.50000	96.0000
2015-04-15/10:15:08	1	23.8000	83.0000
2015-04-15/10:37:32	2	15.8000	441.000
2015-04-15/10:56:44	3	9.50000	63.0000
2015-04-15/11:03:08	4	9.50000	45.0000
2015-04-15/11:57:32	6	15005.6	82.0000
2015-04-15/17:16:47	1	87.9000	54.0000
2015-04-15/17:42:23	2	15.8000	244.000
2015-04-15/18:59:12	6	56.9000	79.0000
2015-04-16/00:13:07	1	15005.6	48.0000
2015-04-16/01:01:07	3	9.50000	207.000
2015-04-16/01:07:31	4	9.50000	90.0000
2015-04-16/07:09:42	1	67.7000	169.000
2015-04-16/07:32:06	2	11.6000	131.000
2015-04-16/08:16:55	5	11.6000	126.000
2015-04-16/09:01:43	6	56.9000	136.000
2015-04-16/14:19:44	1	15005.6	68.0000
2015-04-16/14:42:08	2	67.7000	244.000
2015-04-16/15:55:19	6	1.17376	7.00000
2015-04-16/21:20:39	1	3.95237	17.0000
2015-04-16/21:43:47	2	15.8000	418.000
2015-04-16/21:56:35	3	13.7000	251.000
2015-04-16/22:03:00	4	13.7000	2668.00
2015-04-16/22:28:36	5	15.8000	367.000
2015-04-17/04:09:06	1	351.700	671.000
2015-04-17/04:44:18	2	13.7000	385.000
2015-04-17/06:04:19	6	125.000	79.0000
2015-04-17/11:13:57	1	771.000	405.000
2015-04-17/11:39:33	2	11.6000	56.0000
2015-04-18/01:16:12	1	28.3000	140.000
2015-04-18/01:38:37	2	13.7000	266.000
2015-04-18/02:26:37	5	5.30000	105.000
2015-04-18/08:07:20	1	295.000	99.0000
2015-04-18/09:59:20	6	40.1000	61.0000
2015-04-18/15:08:59	1	15.8000	55.0000
2015-04-18/15:37:47	2	9.50000	56.0000
2015-04-18/16:00:12	3	9.50000	142.000
2015-04-18/16:03:24	4	9.50000	445.000
2015-04-18/16:51:24	6	193.000	120.000
2015-04-18/22:18:07	1	136.300	1513.00
2015-04-18/22:46:55	2	9.50000	92.0000
2015-04-19/05:09:02	1	95.9000	72.0000
2015-04-19/05:44:14	2	7.40000	50.0000

2015-04-19/05:53:50	3	11.6000	112.000
2015-04-19/06:54:38	6	28.3000	120.000
2015-04-19/12:02:58	1	98.1317	5.00000
2015-04-19/12:36:17	2	15.8000	531.000
2015-04-19/13:11:30	5	20.0000	265.000
2015-04-19/13:49:54	6	20.0000	47.0000
2015-04-19/19:10:13	1	15.8000	55.0000
2015-04-19/19:45:25	2	7.40000	47.0000
2015-04-19/19:51:49	3	9.50000	37.0000
2015-04-19/19:58:13	4	9.50000	61.0000
2015-04-19/20:04:37	5	13.7000	304.000
2015-04-19/20:43:02	6	36.8000	112.000
2015-04-20/02:01:20	1	13747.6	79.0000
2015-04-20/02:46:08	2	13.7000	126.000
2015-04-20/03:46:56	6	2867.70	76.0000
2015-04-20/08:40:35	1	215.700	114.000
2015-04-20/10:45:24	6	351.700	117.000
2015-04-20/16:08:55	1	136.300	76.0000
2015-04-20/16:34:31	2	11.6000	98.0000
2015-04-20/17:09:43	5	3.20000	29.0000
2015-04-20/22:58:50	1	3411.70	104.000
2015-04-20/23:37:15	2	7.40000	34.0000
2015-04-21/05:49:51	1	8896.90	68.0000
2015-04-21/06:34:40	2	3.20000	59.0000
2015-04-21/06:53:52	3	3.20000	45.0000
2015-04-21/07:00:16	4	5.30000	32.0000
2015-04-21/07:13:04	5	5.30000	53.0000
2015-04-21/08:07:29	6	11.6000	72.0000
2015-04-21/12:51:31	1	1553.00	1589.00
2015-04-21/13:26:43	2	20.0000	185.000
2015-04-21/19:57:27	1	1009.00	67.0000
2015-04-22/04:07:39	5	3.20000	329.000
2015-04-22/04:52:27	6	3.20000	120.000
2015-04-22/09:51:21	1	215.700	100.000
2015-04-22/10:23:22	2	5.30000	70.0000
2015-04-22/18:06:38	5	20.0000	166.000
2015-04-22/23:52:33	1	329.000	70.0000
2015-04-23/00:24:33	2	15.8000	68.0000
2015-04-23/06:52:04	1	329.000	162.000
2015-04-23/07:49:41	2	3.20000	115.000
2015-04-23/07:59:17	3	5.30000	50.0000
2015-04-23/14:02:18	1	544.300	279.000
2015-04-23/14:34:18	2	7.40000	95.0000
2015-04-23/15:54:19	6	56.9000	78.0000
2015-04-23/21:13:49	1	30.9000	123.000
2015-04-23/22:53:02	6	193.000	100.000
2015-04-24/03:58:14	1	136.300	80.0000
2015-04-24/04:39:50	2	13.7000	2284.00
2015-04-24/04:49:26	3	13.7000	4515.00
2015-04-24/05:11:50	5	5.30000	41.0000
2015-04-24/05:53:27	6	15.8000	50.0000
2015-04-24/17:53:01	1	3411.70	82.0000
2015-04-24/18:28:13	2	351.700	50.0000

2015-04-24/20:01:02	6	15005.6	56.0000
2015-04-25/01:02:08	1	215.700	167.000
2015-04-25/01:37:21	2	9.50000	108.000
2015-04-25/01:50:09	3	7.40000	58.0000
2015-04-25/01:56:33	4	7.40000	58.0000
2015-04-25/02:09:21	5	7.40000	72.0000
2015-04-25/02:50:57	6	17.9000	94.0000
2015-04-25/07:46:45	1	4431.60	92.0000
2015-04-25/09:09:58	5	9.50000	67.0000
2015-04-25/09:41:58	6	28.3000	80.0000
2015-04-25/14:51:37	1	40.1000	54.0000
2015-04-25/17:12:26	6	9.50000	53.0000
2015-04-25/22:26:37	2	7.40000	117.000
2015-04-26/00:02:38	6	1.00000	99.0000
2015-04-26/05:07:52	1	1.00000	86.0000
2015-04-26/05:30:16	2	3.20000	54.0000
2015-04-26/07:03:05	6	3.20000	67.0000
2015-04-26/12:25:31	2	7.40000	51.0000
2015-04-26/13:16:44	5	13.7000	49.0000
2015-04-26/14:04:44	6	15.8000	60.0000
2015-04-26/18:56:15	1	1553.00	2827.00
2015-04-26/20:03:27	5	20.0000	246.000
2015-04-26/21:01:04	6	67.7000	116.000
2015-04-27/03:48:50	6	7.40000	63.0000
2015-04-27/09:05:09	1	646.300	1224.00
2015-04-27/09:30:45	2	20.0000	717.000
2015-04-27/09:43:34	3	11.6000	455.000
2015-04-27/09:46:46	4	11.6000	725.000
2015-04-27/10:05:58	5	11.6000	50.0000
2015-04-27/10:31:34	6	36.8000	60.0000
2015-04-27/15:44:36	1	3.14208	4.00000
2015-04-27/16:30:17	2	8148.90	78.0000
2015-04-27/17:05:29	5	3.20000	49.0000
2015-04-27/17:40:42	6	3.20000	49.0000
2015-04-27/22:54:52	1	102.300	111.000
2015-04-27/23:46:05	3	1.00000	81.0000
2015-04-27/23:52:29	4	3.20000	74.0000
2015-04-28/00:46:53	6	3.20000	102.000
2015-04-28/05:48:33	1	20.0000	74.0000
2015-04-28/07:05:22	5	3.20000	27.0000
2015-04-28/07:46:58	6	9.50000	67.0000
2015-04-28/12:37:41	1	17.9000	52.0000
2015-04-28/14:04:06	5	1.00000	58.0000
2015-04-28/14:42:30	6	3.20000	55.0000
2015-04-28/19:40:25	1	771.000	166.000
2015-04-28/21:51:38	6	3128.30	71.0000
2015-04-29/02:52:44	1	15005.6	112.000
2015-04-29/03:31:09	2	2017.70	110.000
2015-04-29/04:12:45	5	7.40000	108.000
2015-04-29/04:47:57	6	95.9000	116.000
2015-04-29/11:09:50	5	3.20000	67.0000
2015-04-29/11:54:39	6	56.9000	60.0000
2015-04-30/01:36:54	6	1.00000	47.0000

2015-04-30/06:54:00	1	21.8000	82.0000
2015-04-30/07:29:13	2	9.50000	58.0000
2015-04-30/08:39:37	6	646.300	1201.00
2015-04-30/13:51:04	1	385.700	152.000
2015-04-30/14:42:16	3	11.6000	5894.00
2015-04-30/14:48:40	4	11.6000	1203.00
2015-05-02/07:56:20	1	9.16646	44.0000
2015-05-02/08:29:42	2	13.7000	116.000
2015-05-02/16:42:02	5	295.000	200.000
2015-05-02/22:56:45	5	13.7000	140.000
2015-05-03/04:49:48	1	40.1000	96.0000
2015-05-03/05:21:48	2	3.20000	81.0000
2015-05-03/06:00:12	5	3.20000	73.0000
2015-05-03/11:48:31	1	2017.70	1435.00
2015-05-03/12:20:31	2	5.30000	45.0000
2015-05-03/13:02:08	5	1.00000	48.0000
2015-05-03/13:29:38	6	12.4467	41.0000
2015-05-03/18:39:27	1	4.60557	25.0000
2015-05-03/19:10:43	2	15005.6	129.000
2015-05-03/20:01:55	5	1.00000	148.000
2015-05-03/20:30:44	6	11.6000	129.000
2015-05-04/03:37:12	6	28.3000	76.0000
2015-05-04/08:47:07	1	15.8000	61.0000
2015-05-04/09:22:19	2	7.40000	69.0000
2015-05-04/10:29:32	6	3.20000	59.0000
2015-05-04/15:30:39	1	3.20000	72.0000
2015-05-04/16:15:27	2	1.00000	38.0000
2015-05-04/17:00:15	5	3.20000	66.0000
2015-05-04/17:41:52	6	3.20000	48.0000
2015-05-05/05:43:10	1	419.700	701.000
2015-05-05/06:53:34	5	9.50000	61.0000
2015-05-05/07:41:35	6	73.9000	61.0000
2015-05-05/14:33:54	6	73.9000	61.0000
2015-05-05/19:48:05	1	1303.70	2489.00
2015-05-05/20:29:41	3	13.7000	35.0000
2015-05-05/20:42:29	4	13.7000	30.0000
2015-05-05/21:43:18	6	419.700	83.0000
2015-05-06/09:23:01	1	6.75071	19.0000
2015-05-06/10:19:40	2	17.9000	342.000
2015-05-06/10:48:28	5	20.0000	106.000
2015-05-06/11:52:29	6	95.9000	111.000
2015-05-06/16:43:11	1	2867.70	113.000
2015-05-06/17:21:35	2	15.8000	71.0000
2015-05-07/00:56:19	5	7.40000	50.0000
2015-05-07/01:50:44	6	23.8000	71.0000
2015-05-07/06:36:06	1	714.300	718.000
2015-05-07/08:50:31	6	17.9000	149.000
2015-05-07/13:19:57	1	13.4359	85.0000
2015-05-07/14:11:24	2	95.9000	124.000
2015-05-07/20:38:23	1	56.9000	132.000
2015-05-07/21:10:23	2	9.50000	132.000
2015-05-07/21:55:12	5	1.00000	103.000
2015-05-07/22:40:00	6	5.30000	115.000

2015-05-08/03:41:42	1	15005.6	81.0000
2015-05-08/04:10:30	2	351.700	80.0000
2015-05-08/05:20:54	6	125.000	61.0000
2015-05-08/10:43:37	1	13747.6	70.0000
2015-05-08/11:12:25	2	7.40000	49.0000
2015-05-08/12:26:02	6	40.1000	44.0000
2015-05-08/17:39:20	1	2.49792	12.0000
2015-05-08/18:09:20	2	1.70417	0.00000
2015-05-08/19:19:10	6	1009.00	48.0000
2015-05-09/00:36:16	1	15005.6	122.000
2015-05-09/01:08:17	2	33.7000	159.000
2015-05-09/01:21:05	3	33.7000	112.000
2015-05-09/01:30:41	4	43.8000	103.000
2015-05-09/01:46:41	5	20.0000	204.000
2015-05-09/07:39:46	1	5757.60	101.000
2015-05-09/08:08:34	2	272.300	42.0000
2015-05-09/21:31:53	1	3128.30	176.000
2015-05-09/21:57:29	2	11.6000	100.000
2015-05-09/23:30:18	6	147.700	115.000
2015-05-10/04:31:57	1	850.300	489.000
2015-05-10/06:30:23	6	87.9000	63.0000
2015-05-10/11:42:58	1	14.5038	67.0000
2015-05-10/12:05:53	2	2403.00	94.0000
2015-05-10/18:36:37	1	125.000	117.000
2015-05-10/19:08:37	2	17.9000	2060.00
2015-05-11/08:35:49	1	3128.30	59.0000
2015-05-11/09:49:26	5	11.6000	55.0000
2015-05-11/10:34:14	6	15005.6	45.0000
2015-05-12/12:34:01	1	10585.6	74.0000
2015-05-12/12:56:25	2	714.300	73.0000
2015-05-12/19:30:21	1	159.000	50.0000
2015-05-12/19:59:09	2	43.8000	42.0000
2015-05-12/20:43:57	5	13.7000	32.0000
2015-05-12/21:15:58	6	23.8000	42.0000
2015-05-13/04:24:49	6	13.7000	52.0000
2015-05-13/10:37:10	5	9.50000	60.0000
2015-05-13/11:15:34	6	30.9000	66.0000
2015-05-13/16:28:41	1	295.000	117.000
2015-05-13/18:07:54	6	7.40000	60.0000
2015-05-14/00:00:13	2	21.8000	997.000
2015-05-14/00:38:37	5	9.50000	54.0000
2015-05-14/01:20:14	6	20.0000	66.0000
2015-05-14/13:37:42	1	67.7000	90.0000
2015-05-14/14:06:30	2	9.50000	59.0000
2015-05-15/17:26:20	1	12602.9	63.0000
2015-05-15/18:04:44	2	15.8000	63.0000
2015-05-15/18:36:44	5	17.9000	34.0000
2015-05-15/19:18:20	6	181.700	57.0000
2015-05-16/00:15:43	1	159.000	100.000
2015-05-16/02:25:59	6	19.6940	171.000
2015-05-16/08:38:27	5	1.00000	106.000
2015-05-16/09:20:04	6	9.50000	99.0000
2015-05-16/14:28:10	1	30.9000	74.0000

2015-05-16/15:00:10	2	5.30000	76.0000
2015-05-16/16:23:23	6	73.9000	68.0000
2015-05-16/21:20:29	1	227.000	139.000
2015-05-16/22:02:05	2	5.30000	60.0000
2015-05-16/23:34:54	6	136.300	53.0000
2015-05-17/04:55:29	2	15.8000	1782.00
2015-05-17/05:05:05	3	13.7000	131.000
2015-05-17/05:11:29	4	11.6000	48.0000
2015-05-17/05:30:41	5	20.0000	38.0000
2015-05-17/11:30:06	1	465.000	236.000
2015-05-17/11:58:54	2	7.40000	76.0000
2015-05-17/12:21:18	3	15.8000	80.0000
2015-05-17/13:28:31	6	87.9000	70.0000
2015-05-17/18:31:38	1	5.79326	10.0000
2015-05-17/19:01:05	2	1099.70	502.000
2015-05-18/01:19:36	1	1303.70	1269.00
2015-05-18/01:48:24	2	26.0000	460.000
2015-05-18/02:33:12	5	13.7000	40.0000
2015-05-18/03:25:57	6	133.248	354.000
2015-05-18/15:21:03	1	2403.00	90.0000
2015-05-18/15:49:51	2	147.700	43.0000
2015-05-18/17:22:40	7	36.8000	41.0000
2015-05-20/09:19:10	1	465.000	247.000
2015-05-20/09:51:10	2	15.8000	105.000
2015-05-20/10:00:46	3	15.8000	64.0000
2015-05-20/10:07:10	4	13.7000	65.0000
2015-05-20/11:17:35	6	181.700	66.0000
2015-05-20/16:26:18	1	53.2236	84.0000
2015-05-20/16:49:53	2	5.30000	50.0000
2015-05-20/18:29:06	6	329.000	96.0000
2015-05-20/23:49:25	2	15.8000	75.0000
2015-05-21/00:27:49	5	3.20000	46.0000
2015-05-21/01:19:02	6	17.9000	66.0000
2015-05-21/06:17:12	1	15.8000	116.000
2015-05-21/07:05:13	4	7.40000	41.0000
2015-05-21/08:22:01	6	272.300	176.000
2015-05-21/13:30:16	1	193.000	77.0000
2015-05-21/15:09:29	6	2017.70	300.000
2015-05-21/20:16:11	1	2210.30	50.0000
2015-05-21/20:51:23	2	15.8000	135.000
2015-05-21/22:14:36	6	329.000	58.0000
2015-05-22/03:09:35	1	215.700	349.000
2015-05-22/03:35:11	2	9.50000	115.000
2015-05-23/00:17:39	1	4839.60	80.0000
2015-05-23/00:46:27	2	15.8000	100.000
2015-05-23/08:24:23	5	21.8000	62.0000
2015-05-23/09:28:24	6	2210.30	90.0000
2015-05-23/14:45:31	2	7.40000	124.000
2015-05-23/21:10:27	1	136.300	91.0000
2015-05-23/21:45:39	2	7.40000	93.0000
2015-05-24/04:12:22	1	215.700	69.0000
2015-05-24/04:37:59	2	9.50000	62.0000
2015-05-24/13:23:07	6	1099.70	228.000

2015-05-24/18:11:25	1	1859.00	132.000
2015-05-24/18:43:26	2	5.30000	128.000
2015-05-24/20:25:51	6	7.40000	107.000
2015-07-01/22:50:12	1	11.6000	210.000
2015-07-03/09:48:59	3	3.20000	86.0000
2015-07-03/09:55:23	4	3.20000	74.0000
2015-07-05/10:38:26	3	7.40000	45.0000
2015-07-05/10:48:02	4	7.40000	55.0000
2015-07-05/11:04:02	5	7.40000	58.0000
2015-07-05/18:58:14	6	3.20000	127.000
2015-07-05/23:31:34	1	73.9000	88.0000
2015-07-06/00:38:47	2	36.8000	222.000
2015-07-06/08:06:03	5	13.7000	389.000
2015-07-06/08:50:51	6	102.300	45.0000
2015-07-06/20:22:41	1	13.7000	118.000
2015-07-06/21:36:18	2	3.20000	101.000
2015-07-06/22:05:06	5	7.40000	117.000
2015-07-06/23:02:42	6	20.0000	120.000
2015-07-07/04:49:49	2	17.9000	1011.00
2015-07-07/05:05:49	5	7.40000	75.0000
2015-07-07/05:34:37	6	17.9000	68.0000
2015-07-07/12:29:53	6	9.50000	66.0000
2015-07-07/19:04:04	5	3.20000	116.000
2015-07-07/19:36:05	6	7.40000	106.000
2015-07-08/01:42:11	2	13.7000	68.0000
2015-07-08/08:27:50	2	11.6000	76.0000
2015-07-08/08:43:51	3	11.6000	239.000
2015-07-08/08:53:27	4	13.7000	4544.00
2015-07-08/09:03:03	5	9.50000	64.0000
2015-07-10/01:18:02	1	5270.30	63.0000
2015-07-10/02:31:38	2	56.9000	91.0000
2015-07-10/09:31:10	2	601.000	99.0000
2015-07-10/09:40:46	3	544.300	100.000
2015-07-10/09:47:10	4	544.300	53.0000
2015-07-10/09:59:58	5	544.300	61.0000
2015-07-11/06:23:20	2	20.0000	575.000
2015-07-11/06:55:21	5	3.20000	65.0000
2015-07-11/08:02:33	6	62.1000	55.0000
2015-07-11/13:54:52	5	7.40000	52.0000
2015-07-11/15:02:05	6	73.9000	48.0000
2015-07-11/20:38:40	4	11.6000	99.0000
2015-07-11/20:57:52	5	13.7000	105.000
2015-07-11/21:33:04	6	28.3000	119.000
2015-07-12/03:58:17	5	7.40000	69.0000
2015-07-12/04:33:29	6	95.9000	70.0000
2015-07-12/10:37:32	4	5.30000	84.0000
2015-07-12/10:56:45	5	7.40000	46.0000
2015-07-12/11:54:21	6	13.7000	54.0000
2015-07-12/17:27:28	4	11.6000	84.0000
2015-07-12/17:59:28	5	11.6000	82.0000
2015-07-13/00:36:36	4	9.50000	196.000
2015-07-13/00:52:36	5	7.40000	127.000
2015-07-13/07:14:45	2	7.40000	64.0000

2015-07-13/08:50:46	6	1303.70	944.000
2015-07-13/14:51:37	5	17.9000	3999.00
2015-07-14/04:19:43	2	15.8000	84.0000
2015-07-14/04:58:07	5	9.50000	81.0000
2015-07-16/06:42:43	6	918.300	412.000
2015-07-16/19:30:02	3	7.40000	129.000
2015-07-16/19:36:26	4	7.40000	120.000
2015-07-16/19:58:50	5	3.20000	156.000
2015-07-17/10:01:11	6	329.000	219.000
2015-07-17/16:44:42	5	11.6000	131.000
2015-07-17/23:22:55	2	15.8000	95.0000
2015-07-17/23:45:19	5	15.8000	112.000
2015-07-18/06:27:46	2	5.30000	89.0000
2015-07-18/13:49:26	5	1.00000	59.0000
2015-07-18/20:20:10	2	5.30000	223.000
2015-07-18/20:26:34	3	5.30000	336.000
2015-07-18/20:32:58	4	7.40000	182.000
2015-07-18/20:45:46	5	7.40000	139.000
2015-07-18/21:33:46	6	15.8000	108.000
2015-07-19/03:20:49	2	5.30000	119.000
2015-07-19/03:43:13	5	1.00000	83.0000
2015-07-19/04:37:38	6	30.9000	73.0000
2015-07-19/10:22:28	4	9.50000	140.000
2015-07-19/10:44:53	5	9.50000	62.0000
2015-07-20/00:05:32	2	21.8000	98.0000
2015-07-20/00:50:20	5	20.0000	145.000
2015-07-20/01:31:56	6	15005.6	127.000
2015-07-20/07:12:27	2	5.30000	98.0000
2015-07-20/08:19:39	6	4839.60	76.0000
2015-07-21/04:49:21	5	23.8000	92.0000
2015-07-21/11:42:29	5	13.7000	826.000
2015-07-21/12:17:41	6	102.300	55.0000
2015-07-21/18:45:28	5	7.40000	125.000
2015-07-21/19:11:04	6	11.6000	81.0000
2015-07-22/01:51:09	5	13.7000	89.0000
2015-07-22/15:47:00	5	11.6000	569.000
2015-07-22/16:12:37	6	9.50000	39.0000
2015-07-22/22:40:08	5	7.40000	126.000
2015-07-23/12:39:05	5	3.20000	61.0000
2015-07-23/19:42:04	5	7.40000	139.000
2015-07-23/20:10:52	6	20.0000	91.0000
2015-07-24/02:50:57	5	3.20000	84.0000
2015-07-24/09:44:05	4	11.6000	56.0000
2015-07-25/06:10:48	4	9.50000	64.0000
2015-07-25/06:33:13	5	9.50000	57.0000
2015-07-25/07:21:13	6	102.300	64.0000
2015-07-25/13:10:20	2	13.7000	774.000
2015-07-25/13:35:56	5	43.8000	63.0000
2015-07-25/14:11:09	6	95.9000	54.0000
2015-07-26/03:38:03	5	5.30000	73.0000
2015-07-26/03:57:15	6	7.40000	76.0000
2015-07-26/17:01:54	2	11.6000	637.000
2015-07-26/17:27:30	5	9.50000	55.0000

2015-07-26/18:02:42	6	28.3000	41.0000
2015-07-28/10:54:54	2	3.20000	57.0000
2015-07-28/11:30:07	5	1.00000	56.0000
2015-07-28/18:07:14	3	5.30000	754.000
2015-07-28/18:13:38	4	7.40000	292.000
2015-07-28/18:36:02	5	7.40000	124.000
2015-07-29/08:31:57	5	15.8000	1045.00
2015-07-29/09:13:33	6	15.8000	66.0000
2015-07-29/15:15:28	3	1.00000	67.0000
2015-07-29/15:21:52	4	1.00000	58.0000
2015-07-29/15:34:40	5	1.00000	64.0000
2015-07-29/16:25:53	6	3.20000	46.0000
2015-07-29/22:31:16	5	11.6000	124.000
2015-07-29/23:32:04	6	17.9000	107.000
2015-07-30/05:28:35	5	5.30000	75.0000
2015-07-30/12:30:15	5	3.20000	59.0000
2015-07-30/13:27:51	6	5.30000	65.0000
2015-07-30/19:32:58	5	1.00000	125.000
2015-07-31/16:31:46	5	7.40000	154.000
2015-07-31/17:35:47	6	7.40000	97.0000
2015-08-01/00:10:50	6	1.00000	50.0000
2015-08-01/06:24:30	5	11.6000	218.000
2015-08-01/06:53:18	6	11.6000	59.0000
2015-08-01/13:24:01	5	5.30000	48.0000
2015-08-01/13:59:14	6	11.6000	64.0000
2015-08-01/20:23:33	5	9.50000	114.000
2015-08-01/20:45:57	6	20.0000	124.000
2015-08-02/03:17:48	5	7.40000	67.0000
2015-08-02/03:46:36	6	36.8000	164.000
2015-08-02/10:00:15	1	11.6000	688.000
2015-08-02/10:16:16	4	28.3000	79.0000
2015-08-02/10:51:28	5	215.700	320.000
2015-08-02/17:02:59	2	7.40000	233.000
2015-08-02/17:25:23	5	15.8000	88.0000
2015-08-02/18:00:36	6	43.8000	66.0000
2015-08-03/06:47:12	2	3.20000	64.0000
2015-08-03/07:19:12	5	3.20000	65.0000
2015-08-03/08:23:13	6	7.40000	71.0000
2015-08-03/14:20:52	5	20.0000	69.0000
2015-08-03/14:52:52	6	40.1000	70.0000
2015-08-03/22:11:36	6	1.00000	108.000
2015-08-04/04:17:52	5	5.30000	50.0000
2015-08-04/04:43:28	6	9.50000	72.0000
2015-08-04/11:19:32	5	1.00000	58.0000
2015-08-04/11:51:32	6	3.20000	61.0000
2015-08-04/18:19:03	5	11.6000	598.000
2015-08-04/18:47:52	6	26.0000	109.000
2015-08-05/01:16:32	5	3.20000	64.0000
2015-08-05/01:42:08	6	15.8000	87.0000
2015-08-05/08:15:00	5	5.30000	61.0000
2015-08-05/08:43:48	6	13.7000	57.0000
2015-08-05/15:17:43	5	3.20000	56.0000
2015-08-05/15:46:32	6	5.30000	66.0000

2015-08-05/22:17:15	5	7.40000	113.000
2015-08-05/22:58:51	6	47.8000	105.000
2015-08-06/05:17:52	5	7.40000	67.0000
2015-08-06/05:56:16	6	33.7000	72.0000
2015-08-06/12:13:08	5	3.20000	59.0000
2015-08-06/12:45:08	6	5.30000	63.0000
2015-08-07/16:14:25	5	7.40000	129.000
2015-08-07/17:31:14	6	36.8000	100.000
2015-08-07/23:14:58	5	1.00000	70.0000
2015-08-08/00:12:35	6	7.40000	62.0000
2015-08-08/06:10:14	5	1.00000	56.0000
2015-08-08/06:58:14	6	20.0000	67.0000
2015-08-08/13:16:09	5	11.6000	45.0000
2015-08-08/13:41:45	6	15.8000	67.0000
2015-08-08/20:18:53	5	1.00000	108.000
2015-08-09/03:13:04	5	3.20000	66.0000
2015-08-09/03:29:04	6	3.20000	73.0000
2015-08-09/10:11:16	5	23.8000	710.000
2015-08-09/10:46:28	6	62.1000	54.0000
2015-08-09/16:48:23	4	9.50000	94.0000
2015-08-09/17:07:35	5	33.7000	317.000
2015-08-09/17:29:59	6	62.1000	52.0000
2015-08-11/03:37:36	4	11.6000	197.000
2015-08-11/04:09:36	5	13.7000	247.000
2015-08-11/04:35:12	6	28.3000	57.0000
2015-08-11/10:48:35	4	5.30000	52.0000
2015-08-11/11:11:00	5	7.40000	45.0000
2015-08-11/11:33:24	6	11.6000	48.0000
2015-08-11/18:07:35	5	3.20000	139.000
2015-08-11/18:26:47	6	11.6000	129.000
2015-08-12/01:08:06	5	15.8000	551.000
2015-08-12/01:40:06	6	43.8000	80.0000
2015-08-12/07:37:45	4	5.30000	97.0000
2015-08-12/08:03:22	5	5.30000	55.0000
2015-08-12/08:28:58	6	52.1000	77.0000
2015-08-12/15:06:05	5	23.8000	213.000
2015-08-12/15:25:17	6	56.9000	61.0000
2015-08-12/22:05:37	5	7.40000	158.000
2015-08-12/22:28:01	6	13.7000	125.000
2015-08-13/05:15:42	4	1.00000	66.0000
2015-08-13/05:28:30	5	1.00000	96.0000
2015-08-13/05:34:54	6	419.700	85.0000
2015-08-13/11:16:33	2	5.30000	76.0000
2015-08-13/11:32:33	3	5.30000	52.0000
2015-08-13/11:42:09	4	7.40000	55.0000
2015-08-13/11:58:10	5	7.40000	49.0000
2015-08-13/12:30:10	6	43.8000	64.0000
2015-08-13/19:04:05	5	11.6000	146.000
2015-08-13/19:20:05	6	102.300	156.000
2015-08-15/06:04:50	5	9.50000	47.0000
2015-08-15/06:43:14	6	43.8000	74.0000
2015-08-15/13:00:53	5	3.20000	64.0000
2015-08-15/13:32:53	6	215.700	70.0000

2015-08-15/19:57:29	5	5.30000	174.000
2015-08-15/20:19:53	6	11.6000	111.000
2015-08-16/09:59:40	5	47.8000	92.0000
2015-08-16/10:18:52	6	73.9000	63.0000
2015-08-16/17:05:35	5	67.7000	76.0000
2015-08-16/17:21:36	6	125.000	64.0000
2015-08-17/07:05:38	5	11.6000	58.0000
2015-08-17/07:21:38	6	15.8000	74.0000
2015-08-17/13:37:42	4	9.50000	56.0000
2015-08-17/13:53:42	5	11.6000	133.000
2015-08-17/14:28:54	6	43.8000	58.0000
2015-08-17/20:40:25	4	7.40000	111.000
2015-08-17/20:59:37	5	7.40000	156.000
2015-08-17/21:18:49	6	15.8000	129.000
2015-08-18/10:55:30	5	87.9000	69.0000
2015-08-18/11:11:30	6	159.000	66.0000
2015-08-19/00:53:14	5	36.8000	348.000
2015-08-19/01:12:26	6	80.6000	53.0000
2015-08-19/14:34:25	4	9.50000	91.0000
2015-08-19/14:53:37	5	11.6000	287.000
2015-08-19/15:09:37	6	28.3000	136.000
2015-08-19/21:55:02	5	73.9000	83.0000
2015-08-19/22:11:02	6	136.300	98.0000
2015-08-20/11:49:01	5	5.30000	59.0000
2015-08-20/12:21:01	6	73.9000	64.0000
2015-08-20/18:51:45	5	6845.60	149.000
2015-08-20/19:10:57	6	10585.6	131.000
2015-08-21/01:50:00	5	5.30000	76.0000
2015-08-21/02:09:12	6	15.8000	82.0000
2015-08-21/22:51:54	5	21.8000	109.000
2015-08-21/23:17:30	6	40.1000	121.000
2015-08-22/05:36:45	4	13.7000	1262.00
2015-08-22/05:52:46	5	11.6000	329.000
2015-08-22/06:21:34	6	23.8000	76.0000
2015-08-22/12:49:05	5	9.50000	115.000
2015-08-22/13:11:29	6	20.0000	61.0000
2015-08-23/09:50:54	5	11.6000	46.0000
2015-08-23/10:06:54	6	11.6000	70.0000
2015-08-23/16:47:13	5	20.0000	194.000
2015-08-23/17:09:37	6	33.7000	50.0000
2015-08-24/06:16:16	4	5.30000	61.0000
2015-08-24/06:51:28	5	5.30000	67.0000
2015-08-24/07:10:40	6	5.30000	77.0000
2015-08-24/20:48:39	5	5.30000	118.000
2015-08-24/21:04:39	6	43.8000	129.000
2015-08-25/03:46:56	5	13.7000	602.000
2015-08-25/04:09:20	6	26.0000	93.0000
2015-08-25/10:51:00	6	7.40000	65.0000
2015-08-25/17:28:07	4	5.30000	36.0000
2015-08-25/17:44:07	5	3.20000	42.0000
2015-08-26/00:47:07	5	5.30000	113.000
2015-08-26/01:09:31	6	7.40000	147.000
2015-08-26/07:48:22	5	5.30000	75.0000

2015-08-26/08:07:34	6	5.30000	60.0000
2015-08-27/11:38:16	5	5757.60	92.0000
2015-08-27/12:10:16	6	7469.00	74.0000
2015-08-27/17:43:23	2	11.6000	125.000
2015-08-27/18:37:47	5	5.30000	86.0000
2015-08-27/18:56:59	6	5.30000	121.000
2015-08-28/15:38:40	5	19.6940	78.0000
2015-08-28/15:59:58	6	36.3110	520.000
2015-08-28/22:44:16	5	7.40000	68.0000
2015-08-28/23:06:40	6	9.50000	53.0000
2015-08-29/02:55:30	1	1428.30	731.000
2015-08-29/05:38:44	5	11.6000	58.0000
2015-08-29/05:54:44	6	13.7000	57.0000
2015-08-29/19:38:03	5	15005.6	151.000
2015-08-30/02:39:20	5	17.9000	286.000
2015-08-30/02:58:32	6	26.0000	85.0000
2015-08-30/09:40:12	5	9.50000	58.0000
2015-08-30/09:56:12	6	21.8000	69.0000
2015-08-30/16:39:43	5	7.40000	66.0000
2015-08-30/17:08:31	6	13.7000	81.0000
2015-08-31/06:37:26	5	11.6000	194.000
2015-08-31/07:09:26	6	11.6000	88.0000
2015-08-31/13:38:18	5	15005.6	126.000
2015-09-02/00:12:10	4	7.40000	52.0000
2015-09-02/00:34:34	5	7.40000	64.0000
2015-09-02/01:00:10	6	13.7000	62.0000
2015-09-02/07:32:14	5	21.8000	984.000
2015-09-02/08:01:02	6	33.7000	133.000
2015-09-03/04:30:52	4	13.7000	2109.00
2015-09-03/04:50:04	5	20.0000	55.0000
2015-09-03/11:30:23	5	3.20000	67.0000
2015-09-03/11:52:47	6	5.30000	56.0000
2015-09-04/00:23:58	2	7.40000	94.0000
2015-09-04/00:49:34	3	13.7000	80.0000
2015-09-04/01:08:46	4	11.6000	95.0000
2015-09-04/01:27:58	5	9.50000	74.0000
2015-09-04/01:47:10	6	20.0000	65.0000
2015-09-04/08:16:02	3	26.0000	2647.00
2015-09-04/08:22:26	4	26.0000	508.000
2015-09-04/08:28:50	5	26.0000	385.000
2015-09-04/08:44:50	6	21.8000	186.000
2015-09-05/05:32:32	5	13.7000	71.0000
2015-09-05/05:45:20	6	15.8000	68.0000
2015-09-05/12:27:00	5	11.6000	295.000
2015-09-05/12:43:00	6	20.0000	49.0000
2015-09-06/02:27:46	5	9.50000	167.000
2015-09-06/02:46:58	6	15.8000	58.0000
2015-09-08/10:22:02	5	15.8000	749.000
2015-09-08/10:41:14	6	33.7000	69.0000
2015-09-10/01:58:22	1	329.000	93.0000
2015-09-10/03:24:47	2	33.7000	93.0000
2015-09-10/03:31:11	3	23.8000	66.0000
2015-09-10/03:47:11	4	20.0000	280.000

2015-09-10/04:38:24	6	2867.70	108.000
2015-09-12/05:17:38	5	13.7000	81.0000
2015-09-12/05:33:38	6	62.1000	69.0000
2015-09-13/16:16:45	5	7.40000	41.0000
2015-09-13/16:35:57	6	21.8000	62.0000
2015-09-16/07:05:53	5	3.20000	116.000
2015-09-16/07:21:53	6	5.30000	94.0000
2015-09-28/10:26:38	1	1.98581	3.00000
2015-09-29/07:33:42	1	6845.60	140.000
2015-09-30/04:22:38	1	147.700	152.000
2015-09-30/13:49:07	5	7.40000	95.0000
2015-09-30/14:05:07	6	13.7000	102.000
2015-10-01/04:07:21	6	43.8000	91.0000
2015-10-01/08:27:08	1	23.8000	140.000
2015-10-01/11:00:23	6	7.40000	81.0000
2015-10-01/15:26:34	1	351.700	152.000
2015-10-01/18:03:03	6	28.3000	59.0000
2015-10-13/23:31:05	5	87.9000	133.000
2015-10-13/23:43:53	6	102.300	129.000
2015-10-14/04:05:48	1	47.8000	121.000
2015-10-14/06:43:23	6	15005.6	59.0000
2015-10-14/13:42:43	6	465.000	95.0000
2015-10-15/08:10:29	1	419.700	4360.00
2015-10-16/14:34:19	6	125.000	111.000
2015-10-16/21:17:49	5	7.40000	123.000
2015-10-16/21:37:01	6	13.7000	120.000
2015-10-17/11:29:41	6	87.9000	122.000
2015-10-19/02:57:52	1	181.700	161.000
2015-10-19/10:16:40	1	73.9000	119.000
2015-10-23/14:18:37	5	5.30000	99.0000
2015-10-23/14:28:13	6	5.30000	96.0000
2015-10-25/06:10:24	1	147.700	146.000
2015-10-25/08:22:53	6	7.40000	68.0000
2015-10-27/16:08:45	1	249.700	163.000
2015-10-27/16:18:21	2	249.700	180.000
2015-10-28/17:58:14	1	1009.00	4317.00
2015-10-28/20:17:21	6	11.6000	103.000
2015-10-29/00:51:16	1	67.7000	120.000
2015-10-31/18:02:53	5	9.50000	286.000
2015-10-31/18:15:41	6	9.50000	106.000
2015-11-01/07:58:51	5	3.20000	106.000
2015-11-01/08:11:39	6	5.30000	112.000
2015-11-01/13:14:22	1	9.50000	135.000
2015-11-04/03:54:06	1	8896.90	137.000
2015-11-04/13:07:55	6	13.7000	100.000
2015-11-04/17:56:50	1	33.7000	92.0000
2015-11-05/00:49:19	1	40.1000	121.000
2015-11-05/03:06:17	6	36.8000	94.0000
2015-11-07/03:57:41	6	771.000	491.000
2015-11-08/08:01:59	6	3717.60	402.000
2015-11-08/12:37:14	1	20.0000	107.000
2015-11-08/15:08:05	6	95.9000	61.0000
2015-11-09/04:55:31	6	80.6000	111.000

2015-11-09/09:35:18	1	3.20000	127.000
2015-11-09/12:07:53	6	7.40000	77.0000
2015-11-10/08:57:01	6	23.8000	95.0000
2015-11-11/05:55:51	6	13.7000	93.0000
2015-11-12/07:53:02	1	11.6000	107.000
2015-11-12/09:50:57	6	13.7000	89.0000
2015-11-12/16:53:45	6	215.700	86.0000
2015-11-13/06:49:47	6	499.000	98.0000
2015-11-14/10:44:55	6	13.7000	83.0000
2015-11-16/18:44:49	6	1099.70	544.000
2015-11-17/20:37:50	1	850.300	648.000
2015-11-19/14:54:11	1	295.000	189.000
2015-11-20/13:39:23	6	102.300	170.000
2015-11-22/19:52:40	1	16.9008	163.000
2015-11-29/00:33:31	6	15005.6	94.0000
2015-11-29/05:38:22	1	3717.60	130.000
2015-12-01/13:28:16	1	3411.70	127.000
2015-12-01/15:23:19	6	20.0000	110.000
2015-12-01/20:30:50	1	36.8000	103.000
2015-12-01/22:26:03	6	1428.30	242.000
2015-12-02/17:32:56	1	4.97160	8.00000
2015-12-02/19:24:45	6	73.9000	126.000
2015-12-03/14:31:30	1	329.000	137.000
2015-12-04/06:16:19	6	3128.30	123.000
2015-12-05/15:28:08	1	465.000	617.000
2015-12-05/17:17:33	6	3.20000	63.0000
2015-12-06/12:24:40	1	2.14364	1.00000
2015-12-06/14:19:29	6	3.20000	85.0000
2015-12-07/18:18:11	6	40.1000	112.000
2015-12-08/08:14:49	6	95.9000	165.000
2015-12-08/13:31:08	1	56.9000	141.000
2015-12-08/15:13:33	6	1428.30	5913.00
2015-12-08/20:35:19	1	499.000	1829.00
2015-12-09/05:13:35	6	36.8000	143.000
2015-12-09/10:30:20	1	7.86639	25.0000
2015-12-09/11:11:30	2	15005.6	105.000
2015-12-09/11:21:06	3	15005.6	49.0000
2015-12-09/11:30:43	4	12602.9	56.0000
2015-12-09/12:15:31	6	15005.6	134.000
2015-12-10/14:37:34	1	15005.6	128.000
2015-12-10/15:09:34	2	1428.30	95.0000
2015-12-10/15:28:46	3	771.000	42.0000
2015-12-10/15:47:59	4	646.300	93.0000
2015-12-10/16:00:47	5	17.9000	2965.00
2015-12-10/16:10:23	6	1.00000	121.000
2015-12-12/01:43:11	1	102.300	96.0000
2015-12-12/02:08:48	2	95.9000	81.0000
2015-12-12/02:21:36	3	47.8000	72.0000
2015-12-12/02:37:36	4	40.1000	75.0000
2015-12-12/02:50:24	5	26.0000	465.000
2015-12-12/03:09:36	6	28.3000	110.000
2015-12-13/19:26:22	1	113.700	96.0000
2015-12-13/20:14:22	2	9.50000	38.0000

2015-12-13/20:59:11	5	5.30000	152.000
2015-12-13/21:11:59	6	5.30000	119.000
2015-12-14/16:21:32	1	36.8000	140.000
2015-12-14/17:12:44	2	9.50000	38.0000
2015-12-14/17:54:21	5	1.00000	184.000
2015-12-14/18:10:21	6	1.00000	132.000
2015-12-14/23:25:45	1	3.20000	88.0000
2015-12-15/08:08:11	6	17.9000	109.000
2015-12-15/13:23:10	1	13.7000	72.0000
2015-12-15/14:14:22	2	3.20000	40.0000
2015-12-15/15:05:35	6	3.20000	173.000
2015-12-15/20:32:34	1	3.20000	100.000
2015-12-16/17:27:52	1	5.30000	149.000
2015-12-16/19:03:53	6	3.20000	174.000
2015-12-17/00:16:05	1	33.7000	84.0000
2015-12-17/14:27:59	1	1.25505	1.00000
2015-12-17/15:27:13	4	1.00000	38.0000
2015-12-17/15:43:13	5	3.20000	206.000
2015-12-17/15:59:13	6	5.30000	4302.00
2015-12-17/21:24:13	1	193.000	91.0000
2015-12-18/05:57:57	6	3.20000	114.000
2015-12-18/11:28:24	1	1.00000	113.000
2015-12-18/12:42:01	5	1.00000	92.0000
2015-12-18/12:58:01	6	3.20000	121.000
2015-12-18/18:25:59	1	3.20000	95.0000
2015-12-19/02:56:37	6	1.00000	115.000
2015-12-20/06:54:54	5	9.50000	65.0000
2015-12-23/11:52:32	6	102.300	121.000
2015-12-24/07:21:46	1	52.1000	66.0000
2015-12-24/07:53:46	2	7.40000	69.0000
2015-12-24/08:06:34	3	9.50000	203.000
2015-12-24/08:16:11	4	9.50000	63.0000
2015-12-24/08:32:11	5	9.50000	47.0000
2015-12-24/08:54:35	6	15.8000	67.0000
2015-12-24/15:35:10	5	5.30000	138.000
2015-12-24/15:47:58	6	7.40000	144.000
2015-12-24/21:19:07	1	11.6000	84.0000
2015-12-25/11:20:06	1	9.50000	45.0000
2015-12-26/01:14:03	1	7.40000	105.000
2015-12-26/01:42:52	2	1.00000	96.0000
2015-12-26/02:08:28	3	1.00000	43.0000
2015-12-26/02:24:28	4	1.00000	88.0000
2015-12-26/02:40:28	5	1.00000	96.0000
2015-12-26/02:50:04	6	1.00000	73.0000
2015-12-26/08:08:47	1	1.00000	126.000
2015-12-27/19:16:16	1	15.8000	129.000
2015-12-27/19:41:52	2	9.50000	177.000
2015-12-27/20:04:17	3	7.40000	35.0000
2015-12-27/20:20:17	4	7.40000	325.000
2015-12-27/20:36:17	5	9.50000	94.0000
2015-12-27/20:49:05	6	26.0000	92.0000
2015-12-28/02:07:33	1	159.000	97.0000
2015-12-28/03:33:58	5	3.20000	86.0000

```
2015-12-28/09:08:19       1       66.9489       101.000
2015-12-28/17:45:05       6       1303.70       518.000
2015-12-28/23:12:37       1       5270.30       94.0000
2015-12-30/03:15:50       1       125.000       198.000
2015-12-30/04:00:38       2       5.30000       39.0000
2015-12-30/04:03:51       3       5.30000       68.0000
2015-12-30/04:19:51       4       5.30000       138.000
2015-12-30/04:29:27       5       5.30000       70.0000
2015-12-30/04:45:27       6       7.40000       114.000
2015-12-30/10:16:40       1       87.9000       72.0000
2015-12-31/00:15:53       1       87.9000       90.0000
2015-12-31/14:13:20       1       95.9000       74.0000
2015-12-31/14:38:56       2       40.1000       90.0000
2015-12-31/15:01:20       3       36.8000       608.000
2015-12-31/15:10:57       4       33.7000       130.000
2015-12-31/15:26:57       5       40.1000       45.0000
2015-12-31/15:42:57       6       30.9000       70.0000
```

A-3 List of Plasma Boundaries 2015

```
# CCATi boundary location file: time bndnum yvalue zvalue
2016-01-01/18:00:57       1       419.623       4.00000
2016-01-01/18:35:59       2       155.270       7.00000
2016-01-01/18:52:20       3       155.270       2.00000
2016-01-01/19:01:59       4       180.932       28.0000
2016-01-01/19:15:19       5       210.834       20.0000
2016-01-01/19:43:39       6       286.282       43.0000
2016-01-02/01:02:00       1       33.6376       118.000
2016-01-02/01:42:59       2       31.1610       116.000
2016-01-02/01:53:42       3       33.6376       17.0000
2016-01-02/02:44:06       6       15005.6       107.000
2016-01-02/08:02:41       1       15005.6       78.0000
2016-01-02/16:41:33       6       850.300       1825.00
2016-01-02/23:17:05       5       5.30000       77.0000
2016-01-02/23:46:16       6       569.786       23.0000
2016-01-03/19:34:24       2       73.9000       186.000
2016-01-03/20:03:13       4       13747.6       37.0000
2016-01-04/02:09:01       1       155.270       5.00000
2016-01-05/07:42:59       6       1.83961       3.00000
2016-01-05/13:02:40       1       1.83961       12.0000
2016-01-05/14:40:29       6       15005.6       56.0000
2016-01-05/19:46:23       1       90.9067       850.000
2016-01-06/03:00:03       1       15005.6       80.0000
2016-01-06/11:36:09       6       3717.60       316.000
2016-01-09/07:58:13       1       1009.00       195.000
2016-01-09/22:04:32       1       2867.70       194.000
2016-01-11/01:58:44       1       13747.6       98.0000
2016-01-11/03:26:01       6       1009.00       272.000
2016-01-11/09:02:04       1       1303.70       1995.00
2016-01-11/10:31:59       6       5757.60       74.0000
```

2016-01-11/16:01:54	1	7469.00	164.000
2016-01-11/17:25:11	6	1553.00	104.000
2016-01-11/22:56:36	1	36.3110	69.0000
2016-01-12/05:52:00	1	7.28723	7.00000
2016-01-12/21:23:21	6	1303.70	262.000
2016-01-13/16:55:22	1	1700.30	10748.0
2016-01-13/18:25:17	6	499.000	367.000
2016-01-13/23:51:28	1	646.300	2894.00
2016-01-18/08:46:37	1	15005.6	100.000
2016-01-18/10:15:39	6	21.2592	104.000
2016-01-18/15:41:59	1	24.7727	102.000
2016-01-19/00:17:01	6	4057.60	132.000
2016-01-19/05:49:20	1	15005.6	129.000
2016-01-19/12:47:55	1	1201.70	1017.00
2016-01-20/16:46:53	1	125.000	133.000
2016-01-21/22:12:45	6	1201.70	173.000
2016-01-22/03:44:32	1	1099.70	180.000
2016-01-22/05:12:15	6	419.700	233.000
2016-01-22/10:39:57	1	465.000	114.000
2016-01-23/02:07:43	6	419.700	169.000
2016-01-23/07:36:18	1	544.300	2350.00
2016-01-23/09:13:43	6	15005.6	81.0000
2016-01-23/14:38:10	1	8148.90	74.0000
2016-01-24/04:41:18	1	918.300	238.000
2016-01-25/01:44:59	1	9.16646	34.0000
2016-01-29/17:32:39	1	12.4467	112.000
2016-01-29/19:04:41	6	1009.00	376.000
2016-01-30/21:36:42	1	8148.90	86.0000
2016-01-31/18:32:13	1	7469.00	75.0000
2016-01-31/19:58:38	6	249.700	74.0000
2016-02-01/08:37:21	1	159.000	58.0000
2016-02-01/08:53:22	2	249.700	58.0000
2016-02-01/09:09:22	3	272.300	32.0000
2016-02-01/09:19:58	4	22.9488	2.00000
2016-02-01/09:34:38	5	21.2592	28.0000
2016-02-01/09:59:01	6	33.6376	72.0000
2016-02-01/15:31:01	1	133.248	26.0000
2016-02-01/15:56:58	2	159.000	68.0000
2016-02-01/16:09:46	3	36.8000	76.0000
2016-02-01/16:19:22	4	62.1000	43.0000
2016-02-01/16:32:10	5	136.300	54.0000
2016-02-01/16:57:46	6	714.300	71.0000
2016-02-01/22:36:00	1	4.97160	25.0000
2016-02-01/22:59:39	2	2.69644	3.00000
2016-02-02/00:03:10	6	329.000	80.0000
2016-02-02/05:36:49	1	385.700	453.000
2016-02-02/06:02:25	2	295.000	44.0000
2016-02-02/12:33:00	1	2.31401	3.00000
2016-02-02/12:56:23	2	2.69644	0.00000
2016-02-02/19:33:40	1	1.83961	6.00000
2016-02-03/02:26:21	1	3411.70	40.0000
2016-02-03/04:02:22	6	56.9000	56.0000
2016-02-03/09:29:37	1	159.000	162.000

2016-02-03/09:58:25	2	113.700	94.0000
2016-02-03/10:05:21	3	33.6376	26.0000
2016-02-03/10:17:40	4	33.6376	0.00000
2016-02-03/10:31:20	5	33.6376	65.0000
2016-02-03/10:52:58	6	42.3121	104.000
2016-02-03/16:29:54	1	4431.60	90.0000
2016-02-03/17:16:58	4	1134.04	0.00000
2016-02-03/17:38:00	5	265.204	7.00000
2016-02-03/17:57:21	6	245.678	5.00000
2016-02-03/23:31:19	1	36.3110	108.000
2016-02-03/23:30:39	2	13.4359	147.000
2016-02-04/06:26:59	1	5.79326	18.0000
2016-02-04/06:57:29	2	1.00000	51.0000
2016-02-04/07:02:01	3	3.95237	3.00000
2016-02-04/07:55:06	6	15005.6	52.0000
2016-02-04/13:27:21	1	13.4359	340.000
2016-02-04/14:55:18	6	2.14364	17.0000
2016-02-04/20:32:21	1	973.203	0.00000
2016-02-04/21:36:14	5	28.3000	89.0000
2016-02-04/21:55:26	6	147.700	91.0000
2016-02-05/03:28:01	1	15005.6	61.0000
2016-02-05/04:01:19	2	105.931	14.0000
2016-02-05/04:10:01	3	84.2137	1.00000
2016-02-05/04:24:21	4	84.2137	5.00000
2016-02-05/04:42:39	5	98.1317	17.0000
2016-02-05/04:58:39	6	105.931	50.0000
2016-02-05/10:53:25	2	28.3000	171.000
2016-02-05/11:06:13	3	36.8000	48.0000
2016-02-05/11:19:01	4	40.1000	133.000
2016-02-05/11:28:37	5	56.9000	126.000
2016-02-05/17:21:56	1	56.9000	79.0000
2016-02-05/17:57:08	2	5.30000	188.000
2016-02-06/00:49:43	2	15005.6	62.0000
2016-02-06/07:36:59	1	15005.6	106.000
2016-02-06/08:53:00	6	2.49792	6.00000
2016-02-06/14:25:59	1	1.17376	0.00000
2016-02-06/14:45:16	2	1.46247	2.00000
2016-02-06/15:02:41	3	1.57870	0.00000
2016-02-06/15:19:42	4	1.70417	0.00000
2016-02-06/15:31:38	5	1.57870	0.00000
2016-02-06/21:29:38	1	7.86639	6.00000
2016-02-06/21:49:05	2	2629.70	96.0000
2016-02-07/04:31:40	1	2.91075	4.00000
2016-02-07/11:31:58	1	309.034	29.0000
2016-02-07/11:55:05	2	419.700	56.0000
2016-02-07/12:52:41	6	7469.00	115.000
2016-02-07/18:29:56	1	15005.6	81.0000
2016-02-07/18:55:32	2	12602.9	49.0000
2016-02-07/19:08:20	3	4.97160	1.00000
2016-02-07/19:15:38	4	5.36673	2.00000
2016-02-07/19:38:01	5	8.49158	7.00000
2016-02-08/01:26:39	1	42.3121	448.000
2016-02-08/08:29:59	1	2.31401	4.00000

2016-02-08/08:57:38	2	13.4359	68.0000
2016-02-08/09:54:58	6	5.79326	10.0000
2016-02-08/15:28:01	1	13.4359	27.0000
2016-02-08/16:03:39	2	4.97160	2.00000
2016-02-08/16:25:01	4	9.16646	7.00000
2016-02-08/16:38:41	5	11.5303	42.0000
2016-02-08/22:24:18	1	9.16646	79.0000
2016-02-08/22:56:59	2	8896.90	47.0000
2016-02-08/23:32:12	5	1303.70	339.000
2016-02-08/23:57:48	6	15005.6	61.0000
2016-02-09/05:24:47	1	6279.00	77.0000
2016-02-09/06:18:44	4	265.204	0.00000
2016-02-09/06:32:39	5	265.204	5.00000
2016-02-09/12:14:57	1	245.678	35.0000
2016-02-09/13:02:43	3	26.0000	39.0000
2016-02-10/02:17:31	1	1553.00	93.0000
2016-02-10/09:21:38	1	62.0198	265.000
2016-02-10/09:55:59	2	13.7000	81.0000
2016-02-10/10:03:37	3	105.931	8.00000
2016-02-10/10:12:00	4	98.1317	18.0000
2016-02-10/10:33:38	5	105.931	38.0000
2016-02-10/10:56:41	6	105.931	252.000
2016-02-10/16:19:58	1	773.685	11.0000
2016-02-10/16:54:00	2	1.17376	1.00000
2016-02-10/17:05:39	3	1.17376	0.00000
2016-02-10/17:20:40	4	1.70417	1.00000
2016-02-10/17:32:19	5	2.31401	2.00000
2016-02-10/17:47:19	6	5.79326	32.0000
2016-02-10/23:24:01	1	26.7415	97.0000
2016-02-10/23:23:21	2	24.7727	108.000
2016-02-11/00:30:26	6	15005.6	53.0000
2016-02-11/06:25:56	1	33.6376	154.000
2016-02-12/03:21:41	1	53.2236	236.000
2016-02-12/10:24:40	1	2.14364	8.00000
2016-02-12/11:57:19	6	1.83961	2.00000
2016-02-12/17:22:41	1	1.83961	2.00000
2016-02-13/00:27:39	1	123.438	112.000
2016-02-13/00:47:01	2	84.2137	35.0000
2016-02-13/00:59:00	3	72.2698	5.00000
2016-02-13/01:14:01	4	62.0198	9.00000
2016-02-13/01:31:01	5	53.2236	22.0000
2016-02-13/01:55:00	6	90.9067	33.0000
2016-02-13/07:50:01	2	5.30000	54.0000
2016-02-13/07:59:58	3	15.6565	16.0000
2016-02-13/08:11:17	4	18.2440	19.0000
2016-02-13/08:57:18	6	1.17376	1.00000
2016-02-13/14:24:12	1	15005.6	70.0000
2016-02-13/15:50:37	6	544.300	111.000
2016-02-13/21:49:20	2	388.728	4.00000
2016-02-13/22:29:00	5	3.95237	2.00000
2016-02-13/22:51:18	6	6.75071	17.0000
2016-02-14/04:26:19	1	1.25505	2.00000
2016-02-14/04:52:21	2	11548.9	49.0000

2016-02-14/05:56:22	6	2629.70	90.0000
2016-02-14/11:33:13	1	918.300	1849.00
2016-02-14/18:15:59	1	452.973	19.0000
2016-02-14/18:46:10	2	13.7000	1681.00
2016-02-15/01:18:58	1	210.834	706.000
2016-02-15/02:52:22	6	5270.30	208.000
2016-02-15/08:19:21	1	8896.90	99.0000
2016-02-15/08:48:09	2	7469.00	76.0000
2016-02-15/15:19:42	1	385.700	208.000
2016-02-15/15:45:18	2	215.700	64.0000
2016-02-15/16:55:42	6	6845.60	68.0000
2016-02-15/22:22:09	1	7469.00	60.0000
2016-02-15/22:41:21	2	3411.70	91.0000
2016-02-16/19:14:57	1	102.300	58.0000
2016-02-16/19:46:57	2	1.00000	59.0000
2016-02-16/20:50:58	6	351.700	52.0000
2016-02-17/02:21:09	1	272.300	230.000
2016-02-17/02:43:33	2	159.000	111.000
2016-02-17/09:18:18	1	125.000	74.0000
2016-02-17/10:38:18	5	1428.30	90.0000
2016-02-17/10:57:30	6	2403.00	457.000
2016-02-19/10:19:01	1	53.2236	153.000
2016-02-19/11:56:17	6	8.49158	8.00000
2016-02-19/17:19:39	1	39.1969	167.000
2016-02-20/08:51:03	6	1.98581	7.00000
2016-02-20/14:44:13	2	26.0000	166.000
2016-02-20/15:00:14	3	20.0000	45.0000
2016-02-20/15:35:26	5	9.50000	91.0000
2016-02-20/15:57:50	6	95.9000	100.000
2016-02-20/21:15:46	1	193.000	96.0000
2016-02-20/21:44:37	2	53.2236	14.0000
2016-02-20/22:52:00	6	5.36673	21.0000
2016-02-21/04:17:18	1	4.97160	21.0000
2016-02-21/05:02:46	4	249.700	32.0000
2016-02-21/05:25:10	5	329.000	46.0000
2016-02-21/05:50:46	6	646.300	126.000
2016-02-21/11:19:21	1	15.6565	41.0000
2016-02-21/11:43:20	2	1.57870	1.00000
2016-02-21/12:57:14	6	2629.70	109.000
2016-02-21/18:18:18	1	3717.60	176.000
2016-02-21/18:50:18	2	147.700	70.0000
2016-02-21/19:54:18	6	714.300	342.000
2016-02-22/01:20:20	1	53.2236	243.000
2016-02-22/01:46:21	2	15005.6	48.0000
2016-02-22/02:25:38	5	18.2440	66.0000
2016-02-22/02:44:19	6	19.6940	122.000
2016-02-22/08:20:01	1	4.97160	25.0000
2016-02-22/08:45:40	2	1.17376	1.00000
2016-02-22/09:50:19	6	84.2137	79.0000
2016-02-22/15:20:39	1	62.0198	387.000
2016-02-22/16:47:40	6	1.17376	2.00000
2016-02-22/22:23:00	1	3.66137	44.0000
2016-02-22/23:59:40	6	26.7415	181.000

2016-02-23/05:21:41	1	6.75071	82.0000
2016-02-23/12:19:51	1	646.300	2674.00
2016-02-24/09:24:18	1	26.7415	76.0000
2016-02-24/16:23:39	1	98.1317	127.000
2016-02-24/23:18:41	1	28.8668	59.0000
2016-02-25/06:21:00	1	9.89498	26.0000
2016-02-25/13:34:21	2	23.8000	199.000
2016-02-25/20:34:58	2	80.6000	102.000
2016-02-25/20:54:10	3	95.9000	41.0000
2016-02-25/21:03:46	4	136.300	41.0000
2016-02-26/03:20:20	1	72.2698	210.000
2016-02-26/03:37:25	2	13.7000	49.0000
2016-02-26/10:20:38	1	3.39180	4.00000
2016-02-26/17:24:00	1	2.91075	1.00000
2016-02-27/00:19:59	1	1.46247	2.00000
2016-02-27/01:25:24	5	87.9000	58.0000
2016-02-27/07:20:23	1	465.000	283.000
2016-02-27/07:52:24	3	3.20000	34.0000
2016-02-27/08:05:12	4	3.20000	42.0000
2016-02-27/08:27:36	5	5.30000	57.0000
2016-02-27/14:20:11	1	13747.6	59.0000
2016-02-27/14:48:59	2	147.700	50.0000
2016-02-27/14:58:35	3	1.00000	40.0000
2016-02-27/15:04:58	4	114.350	12.0000
2016-02-27/15:31:38	5	114.350	29.0000
2016-02-27/15:52:19	6	105.931	109.000
2016-02-28/11:18:20	1	167.611	110.000
2016-02-28/11:39:18	2	195.311	13.0000
2016-02-28/11:45:20	3	180.932	7.00000
2016-02-28/18:10:11	1	8148.90	132.000
2016-02-28/18:35:47	2	6845.60	74.0000
2016-02-28/18:54:59	3	8148.90	35.0000
2016-02-28/19:04:35	4	11548.9	39.0000
2016-02-29/01:16:22	1	3.14208	2.00000
2016-02-29/01:34:40	2	1.83961	1.00000
2016-02-29/01:48:39	3	1.98581	1.00000
2016-02-29/02:05:20	4	2.49792	1.00000
2016-02-29/02:14:39	5	3.39180	4.00000
2016-02-29/08:16:01	1	1.17376	4.00000
2016-02-29/08:38:39	2	1.83961	1.00000
2016-02-29/08:50:58	3	2.31401	1.00000
2016-02-29/09:52:16	6	7.28723	11.0000
2016-02-29/15:20:40	1	4.60557	33.0000
2016-02-29/15:48:11	2	15.8000	561.000
2016-02-29/16:17:00	5	15.6565	21.0000
2016-02-29/16:50:41	6	33.6376	313.000
2016-02-29/22:19:38	1	8.49158	36.0000
2016-02-29/22:43:37	2	6.25368	3.00000
2016-02-29/23:58:45	6	4431.60	80.0000
2016-03-01/05:12:39	1	1428.30	470.000
2016-03-01/05:38:15	2	850.300	57.0000
2016-03-01/05:47:52	3	1303.70	24.0000
2016-03-01/12:15:39	1	11548.9	67.0000

2016-03-01/19:11:01	1	18.2440	51.0000
2016-03-01/19:40:38	2	3.95237	2.00000
2016-03-02/02:37:50	2	3.20000	76.0000
2016-03-02/02:50:38	3	5.30000	39.0000
2016-03-02/09:18:09	1	3.20000	58.0000
2016-03-02/09:34:09	2	1.00000	33.0000
2016-03-02/09:53:22	3	3.20000	23.0000
2016-03-02/10:02:58	4	5.30000	31.0000
2016-03-02/10:18:58	5	5.30000	40.0000
2016-03-02/10:44:34	6	15.8000	54.0000
2016-03-02/16:11:00	1	3.66137	4.00000
2016-03-02/16:40:40	2	3.14208	2.00000
2016-03-02/17:50:46	6	15005.6	43.0000
2016-03-02/23:13:39	1	53.2236	139.000
2016-03-03/06:18:56	1	57.4536	513.000
2016-03-03/06:45:19	2	45.6749	38.0000
2016-03-03/07:25:06	5	646.300	154.000
2016-03-03/07:41:06	6	1553.00	75.0000
2016-03-03/13:17:25	1	4839.60	99.0000
2016-03-03/20:20:25	1	465.000	161.000
2016-03-03/20:42:49	2	125.000	62.0000
2016-03-04/03:16:21	1	72.2698	153.000
2016-03-04/03:38:20	2	62.0198	12.0000
2016-03-04/03:48:19	3	57.4536	2.00000
2016-03-04/03:58:41	4	45.6749	9.00000
2016-03-04/10:13:01	1	19.6940	123.000
2016-03-04/11:14:32	5	351.700	53.0000
2016-03-04/17:14:40	1	1.46247	4.00000
2016-03-05/07:38:44	2	17.9000	344.000
2016-03-05/07:48:20	3	21.8000	42.0000
2016-03-05/08:17:08	5	3.20000	58.0000
2016-03-05/08:42:44	6	9.50000	60.0000
2016-03-05/14:12:23	1	272.300	68.0000
2016-03-05/21:05:47	1	3411.70	52.0000
2016-03-05/21:34:35	2	1009.00	42.0000
2016-03-06/04:08:46	1	8148.90	106.000
2016-03-06/11:28:03	2	3.20000	56.0000
2016-03-06/11:47:15	3	5.30000	41.0000
2016-03-06/12:00:03	4	7.40000	43.0000
2016-03-06/12:16:03	5	9.50000	65.0000
2016-03-06/12:44:52	6	36.8000	75.0000
2016-03-06/18:21:11	1	28.3000	57.0000
2016-03-06/18:37:11	2	20.0000	45.0000
2016-03-06/19:47:35	6	1859.00	69.0000
2016-03-07/01:08:10	1	12602.9	97.0000
2016-03-07/01:49:46	3	40.1000	37.0000
2016-03-07/01:56:10	4	56.9000	31.0000
2016-03-07/02:47:23	6	15005.6	100.000
2016-03-07/08:05:00	1	5757.60	90.0000
2016-03-07/08:40:12	2	5757.60	52.0000
2016-03-07/09:09:00	5	419.700	303.000
2016-03-07/09:44:12	6	850.300	471.000
2016-03-07/15:10:19	1	2.14364	4.00000

2016-03-07/15:38:38	2	1.17376	0.00000
2016-03-07/15:45:00	3	1.17376	0.00000
2016-03-07/15:57:00	4	1.25505	0.00000
2016-03-07/16:08:39	5	1.35479	0.00000
2016-03-07/16:54:20	6	1.57870	4.00000
2016-03-07/22:13:38	1	16.9008	155.000
2016-03-08/05:06:38	1	66.9489	913.000
2016-03-08/05:37:39	2	33.6376	23.0000
2016-03-08/06:20:39	5	3128.30	119.000
2016-03-08/06:39:51	6	15005.6	99.0000
2016-03-08/12:10:38	1	1.46247	2.00000
2016-03-08/12:39:04	2	15005.6	43.0000
2016-03-08/13:07:52	5	499.000	50.0000
2016-03-08/13:33:28	6	3128.30	71.0000
2016-03-08/19:03:21	1	1.25505	2.00000
2016-03-08/19:32:41	2	1.35479	1.00000
2016-03-08/19:43:40	3	1.57870	0.00000
2016-03-08/19:57:40	4	1.57870	1.00000
2016-03-08/20:53:40	6	1.70417	1.00000
2016-03-09/02:38:23	2	23.8000	198.000
2016-03-09/02:47:59	3	36.8000	37.0000
2016-03-09/03:00:47	4	47.8000	45.0000
2016-03-09/03:48:48	6	215.700	57.0000
2016-03-09/09:09:18	1	7.86639	10.0000
2016-03-09/09:33:21	2	8.49158	7.00000
2016-03-09/09:43:00	3	9.89498	1.00000
2016-03-09/10:04:38	4	16.9008	20.0000
2016-03-09/10:21:22	5	22.9488	23.0000
2016-03-09/16:25:16	2	13.7000	66.0000
2016-03-09/17:51:40	6	8896.90	62.0000
2016-03-09/23:12:41	1	5.79326	10.0000
2016-03-09/23:34:59	2	7.86639	3.00000
2016-03-09/23:44:38	3	12.4467	4.00000
2016-03-09/23:55:21	4	11.5303	13.0000
2016-03-10/00:15:59	5	13.4359	14.0000
2016-03-10/00:47:19	6	39.1969	227.000
2016-03-10/06:08:19	1	15005.6	63.0000
2016-03-10/06:27:31	2	15005.6	35.0000
2016-03-10/06:40:19	3	15005.6	55.0000
2016-03-10/07:27:00	5	1.17376	1.00000
2016-03-10/07:49:39	6	1.17376	0.00000
2016-03-10/13:08:06	1	15005.6	132.000
2016-03-10/14:18:31	5	28.3000	85.0000
2016-03-10/14:40:55	6	73.9000	113.000
2016-03-10/20:11:26	1	17.9000	70.0000
2016-03-10/20:27:26	2	11.6000	57.0000
2016-03-10/21:50:39	6	544.300	237.000
2016-03-11/03:02:38	1	24.7727	164.000
2016-03-11/03:35:59	2	4.97160	7.00000
2016-03-11/04:46:58	6	136.300	59.0000
2016-03-11/10:08:21	1	1.83961	1.00000
2016-03-11/10:35:01	2	1.25505	0.00000
2016-03-11/11:37:10	6	2867.70	933.000

2016-03-11/17:07:28	1	3717.60	147.000
2016-03-11/17:36:16	2	2629.70	142.000
2016-03-11/19:00:38	5	1.70417	3.00000
2016-03-12/00:08:20	1	1.46247	12.0000
2016-03-12/00:36:03	2	1.25505	0.00000
2016-03-12/07:06:31	1	12602.9	65.0000
2016-03-12/07:32:07	2	15005.6	41.0000
2016-03-12/14:03:22	1	12602.9	139.000
2016-03-12/14:38:35	2	13747.6	64.0000
2016-03-12/15:07:23	5	419.700	464.000
2016-03-12/15:39:23	6	1553.00	3127.00
2016-03-12/21:06:26	1	4839.60	390.000
2016-03-12/21:28:50	2	4839.60	56.0000
2016-03-13/18:24:54	2	5.30000	71.0000
2016-03-14/01:05:13	1	5.30000	55.0000
2016-03-14/01:30:49	2	9.50000	387.000
2016-03-14/01:37:14	3	9.50000	204.000
2016-03-14/08:02:01	1	39.1969	67.0000
2016-03-14/08:24:19	2	42.3121	13.0000
2016-03-14/08:39:35	3	36.3110	17.0000
2016-03-14/08:50:59	4	36.3110	12.0000
2016-03-14/14:59:18	1	33.6376	107.000
2016-03-14/15:23:37	2	28.8668	30.0000
2016-03-14/15:40:22	3	24.7727	5.00000
2016-03-14/16:37:37	6	6845.60	114.000
2016-03-15/05:02:43	1	7.28723	7.00000
2016-03-15/05:25:21	2	5.79326	0.00000
2016-03-15/05:40:37	3	6.75071	2.00000
2016-03-15/11:57:38	1	2210.30	137.000
2016-03-15/12:26:26	2	1303.70	114.000
2016-03-15/19:03:40	1	4.60557	25.0000
2016-03-15/19:21:40	2	6.75071	5.00000
2016-03-15/19:39:21	3	8.49158	7.00000
2016-03-15/19:47:56	4	9.16646	2.00000
2016-03-15/20:06:41	5	9.16646	18.0000
2016-03-16/02:01:41	1	286.282	280.000
2016-03-16/02:34:38	2	265.204	1.00000
2016-03-16/03:48:36	6	10.6814	29.0000
2016-03-16/09:02:00	1	39.1969	230.000
2016-03-16/09:32:20	2	45.6749	30.0000
2016-03-16/09:40:39	3	49.3050	1.00000
2016-03-16/09:53:58	4	72.2698	7.00000
2016-03-16/10:05:01	5	84.2137	20.0000
2016-03-16/16:00:41	1	15.6565	44.0000
2016-03-16/16:28:57	2	8.49158	11.0000
2016-03-16/17:03:59	5	771.000	360.000
2016-03-16/17:35:59	6	3128.30	1444.00
2016-03-16/23:05:18	1	84.2137	69.0000
2016-03-16/23:28:00	2	98.1317	27.0000
2016-03-17/00:07:04	5	601.000	82.0000
2016-03-17/00:42:17	6	2017.70	165.000
2016-03-17/06:05:47	1	1099.70	241.000
2016-03-17/06:28:11	2	1428.30	53.0000

2016-03-17/07:45:00	6	67.7000	59.0000
2016-03-17/13:05:35	1	771.000	974.000
2016-03-17/13:27:59	2	544.300	93.0000
2016-03-17/14:12:47	5	56.9000	81.0000
2016-03-17/14:41:36	6	181.700	119.000
2016-03-17/20:06:59	1	1.17376	3.00000
2016-03-17/20:23:20	2	1.17376	0.00000
2016-03-17/20:39:16	3	1.70417	0.00000
2016-03-17/20:48:39	4	2.31401	1.00000
2016-03-17/21:13:42	5	4.97160	3.00000
2016-03-18/03:09:38	1	3.95237	5.00000
2016-03-18/03:27:43	2	5.36673	8.00000
2016-03-18/17:07:00	1	4.26649	7.00000
2016-03-18/17:31:38	2	4.60557	1.00000
2016-03-18/18:02:30	5	15.8000	322.000
2016-03-19/00:07:37	1	2017.70	466.000
2016-03-19/01:40:26	6	544.300	228.000
2016-03-19/07:05:18	1	5.79326	12.0000
2016-03-19/07:30:21	2	5.79326	9.00000
2016-03-19/08:11:25	5	9.50000	90.0000
2016-03-19/08:49:50	6	36.8000	101.000
2016-03-19/14:01:01	1	36.3110	753.000
2016-03-19/21:06:59	1	15005.6	59.0000
2016-03-19/21:22:59	2	15005.6	44.0000
2016-03-19/21:35:47	3	1.00000	36.0000
2016-03-19/21:48:36	4	3.20000	30.0000
2016-03-19/21:58:12	5	5.30000	50.0000
2016-03-19/22:39:48	6	30.9000	46.0000
2016-03-20/04:28:55	2	80.6000	63.0000
2016-03-20/04:35:19	3	95.9000	73.0000
2016-03-20/04:41:43	4	102.300	33.0000
2016-03-20/04:48:07	5	102.300	42.0000
2016-03-20/05:33:18	6	2.14364	4.00000
2016-03-20/11:04:59	1	10.6814	31.0000
2016-03-20/11:22:40	2	7.28723	6.00000
2016-03-20/11:35:36	3	8.49158	2.00000
2016-03-20/11:46:39	4	9.16646	0.00000
2016-03-21/01:05:01	1	53.2236	456.000
2016-03-21/01:22:09	2	7469.00	50.0000
2016-03-21/02:55:41	6	1.46247	1.00000
2016-03-21/08:07:40	1	4.97160	8.00000
2016-03-21/08:26:37	2	4.26649	5.00000
2016-03-21/09:57:58	6	15005.6	43.0000
2016-03-21/15:03:01	1	11.5303	37.0000
2016-03-21/15:31:21	2	6.25368	12.0000
2016-03-21/15:56:57	5	43.8000	120.000
2016-03-21/16:41:45	6	215.700	126.000
2016-03-21/22:02:36	1	13747.6	60.0000
2016-03-21/22:21:48	2	12602.9	57.0000
2016-03-21/23:38:37	6	15005.6	76.0000
2016-03-22/05:05:01	1	18.2440	75.0000
2016-03-22/12:03:59	1	15.6565	60.0000
2016-03-22/12:22:40	2	11.5303	15.0000

2016-03-23/15:54:46	1	4431.60	96.0000
2016-03-23/22:58:04	1	15005.6	67.0000
2016-03-23/23:17:16	2	15005.6	51.0000
2016-03-24/00:40:28	6	544.300	59.0000
2016-03-24/13:00:38	1	2.14364	8.00000
2016-03-24/13:19:20	2	2.69644	0.00000
2016-03-24/13:35:47	3	15005.6	47.0000
2016-03-24/13:42:11	4	15005.6	41.0000
2016-03-24/19:57:42	1	7.86639	3.00000
2016-03-24/20:18:40	2	10.6814	9.00000
2016-03-25/02:59:16	1	14.5038	31.0000
2016-03-25/03:17:21	2	11.5303	25.0000
2016-03-25/03:34:18	3	12.4467	5.00000
2016-03-25/04:42:44	6	7469.00	58.0000
2016-03-25/10:03:19	1	84.2137	95.0000
2016-03-25/10:24:58	2	26.7415	46.0000
2016-03-25/17:00:38	1	78.0135	99.0000
2016-03-25/17:19:20	2	66.9489	14.0000
2016-03-26/00:00:00	1	13.4359	36.0000
2016-03-26/06:59:58	1	5.36673	1.00000
2016-03-26/07:30:39	2	6.75071	2.00000
2016-03-26/14:02:29	1	15005.6	86.0000
2016-03-26/14:18:37	2	1.25505	2.00000
2016-03-26/21:01:59	1	26.7415	298.000
2016-03-26/21:26:58	2	26.7415	43.0000
2016-03-26/22:00:18	5	23.8000	187.000
2016-03-26/22:35:30	6	147.700	69.0000
2016-03-27/04:24:37	2	26.0000	157.000
2016-03-27/05:26:01	6	1.46247	5.00000
2016-03-27/10:55:21	1	24.7727	214.000
2016-03-27/11:24:01	2	9.89498	8.00000
2016-03-27/12:50:50	6	7469.00	126.000
2016-03-27/17:52:24	1	11548.9	68.0000
2016-03-27/18:24:24	2	8148.90	46.0000
2016-03-27/18:34:00	3	9701.60	41.0000
2016-03-27/18:46:48	4	12602.9	43.0000
2016-03-27/19:06:00	5	15005.6	64.0000
2016-03-27/19:38:00	6	15005.6	74.0000
2016-03-28/00:58:01	1	4.97160	4.00000
2016-03-28/01:23:40	2	5.36673	4.00000
2016-03-28/08:01:39	1	10.6814	19.0000
2016-03-28/08:19:40	2	13.4359	20.0000
2016-03-28/21:59:39	1	10.6814	7.00000
2016-03-28/22:20:41	2	15.6565	26.0000
2016-03-29/04:58:21	1	14.5038	51.0000
2016-03-29/05:15:38	2	15.6565	50.0000
2016-03-29/19:23:00	2	7.40000	50.0000
2016-03-29/20:01:24	5	3.20000	58.0000
2016-03-29/20:36:36	6	9.50000	68.0000
2016-03-30/01:58:00	1	1859.00	418.000
2016-03-30/02:26:49	2	1009.00	49.0000
2016-03-30/02:42:49	4	28.3000	43.0000
2016-03-30/02:58:49	5	40.1000	144.000

2016-03-30/03:40:25	6	73.9000	47.0000
2016-03-30/09:20:12	2	15.8000	988.000
2016-03-30/16:00:48	1	62.1000	47.0000
2016-03-30/23:01:20	1	2.69644	4.00000
2016-03-30/23:20:41	2	3.39180	2.00000
2016-03-31/05:54:00	1	4.60557	5.00000
2016-03-31/06:15:58	2	4.60557	3.00000
2016-03-31/06:32:59	3	5.36673	0.00000
2016-03-31/06:38:00	4	5.36673	0.00000
2016-03-31/19:52:01	1	1.83961	0.00000
2016-03-31/20:24:41	2	15005.6	51.0000
2016-03-31/21:25:29	6	8148.90	66.0000
2016-04-01/02:56:41	1	133.248	1380.00
2016-04-01/03:24:00	2	1.17376	1.00000
2016-04-01/04:35:41	5	2629.70	632.000
2016-04-01/16:52:58	1	4.26649	60.0000
2016-04-01/17:21:58	2	2.91075	4.00000
2016-04-01/23:47:38	1	123.438	2191.00
2016-04-02/00:21:00	2	4.26649	5.00000
2016-04-02/01:38:19	6	4057.60	130.000
2016-04-02/08:41:03	6	1009.00	128.000
2016-04-02/21:32:37	1	15005.6	49.0000
2016-04-03/04:23:37	2	17.9000	197.000
2016-04-03/04:57:39	5	245.678	2.00000
2016-04-03/11:13:32	2	15.8000	6440.00
2016-04-03/18:19:17	2	5.30000	69.0000
2016-04-04/00:54:00	1	3717.60	163.000
2016-04-04/01:16:25	2	1859.00	44.0000
2016-04-04/08:16:12	2	15.8000	7719.00
2016-04-04/09:39:25	6	5757.60	43.0000
2016-04-04/14:54:58	1	4.97160	16.0000
2016-04-04/15:16:40	2	1.17376	0.00000
2016-04-04/16:45:20	6	601.000	90.0000
2016-04-04/21:49:13	1	4057.60	83.0000
2016-04-04/22:11:37	2	2210.30	70.0000
2016-04-04/23:41:14	6	227.000	58.0000
2016-04-05/05:12:12	2	17.9000	469.000
2016-04-05/06:38:37	6	272.300	78.0000
2016-04-05/19:11:01	2	7.40000	75.0000
2016-04-06/01:49:58	1	2.49792	13.0000
2016-04-06/02:17:01	2	2.49792	1.00000
2016-04-06/03:37:45	6	80.6000	57.0000
2016-04-06/08:35:12	1	47.8000	85.0000
2016-04-06/09:13:37	2	23.8000	1283.00
2016-04-06/10:36:50	6	73.9000	79.0000
2016-04-06/15:54:44	1	295.000	97.0000
2016-04-06/16:13:56	2	295.000	77.0000
2016-04-06/17:43:33	6	601.000	165.000
2016-04-06/22:57:44	1	125.000	59.0000
2016-04-06/23:13:44	2	87.9000	109.000
2016-04-08/02:48:38	1	28.8668	104.000
2016-04-08/03:14:57	2	8.49158	9.00000
2016-04-08/04:39:15	6	918.300	337.000

2016-04-08/09:52:01	1	57.4536	960.000
2016-04-08/10:12:39	2	1.57870	1.00000
2016-04-08/11:39:03	6	2017.70	236.000
2016-04-08/16:46:03	1	2.14364	11.0000
2016-04-08/17:13:38	2	1.17376	2.00000
2016-04-08/18:54:00	6	13747.6	82.0000
2016-04-08/23:46:21	1	1.83961	1.00000
2016-04-09/00:12:00	2	2.31401	5.00000
2016-04-09/01:47:55	6	1553.00	254.000
2016-04-09/06:42:54	1	3717.60	54.0000
2016-04-09/07:11:42	2	4057.60	44.0000
2016-04-09/08:38:07	6	159.000	63.0000
2016-04-09/13:46:21	1	6.75071	4.00000
2016-04-09/14:12:41	2	3.95237	3.00000
2016-04-09/15:34:42	6	4431.60	68.0000
2016-04-09/20:43:58	1	2.31401	3.00000
2016-04-09/22:46:44	6	5757.60	65.0000
2016-04-10/03:45:26	1	15005.6	60.0000
2016-04-10/04:11:02	2	15005.6	60.0000
2016-04-10/05:47:03	6	21.8000	72.0000
2016-04-10/10:35:38	1	601.000	219.000
2016-04-10/11:07:38	2	499.000	52.0000
2016-04-10/12:46:51	6	2017.70	85.0000
2016-04-10/18:13:05	2	15.8000	7520.00
2016-04-10/19:39:30	6	113.700	72.0000
2016-04-11/00:44:36	1	419.700	637.000
2016-04-11/01:10:12	2	9.50000	69.0000
2016-04-11/07:44:57	1	57.4536	269.000
2016-04-11/14:53:18	1	26.7415	274.000
2016-04-11/15:09:59	2	14.5038	34.0000
2016-04-11/21:48:39	1	11.5303	36.0000
2016-04-12/04:54:39	1	11.5303	51.0000
2016-04-12/05:09:23	2	11.5303	27.0000
2016-04-12/11:54:01	1	24.7727	294.000
2016-04-12/12:12:18	2	26.7415	118.000
2016-04-12/13:29:13	6	26.0000	71.0000
2016-04-12/19:12:12	2	7.40000	49.0000
2016-04-12/20:32:12	6	113.700	65.0000
2016-04-13/01:45:33	1	499.000	167.000
2016-04-13/02:17:33	2	544.300	71.0000
2016-04-13/03:40:46	6	465.000	311.000
2016-04-13/08:49:20	1	771.000	579.000
2016-04-13/10:31:45	6	62.1000	46.0000
2016-04-14/07:43:45	6	2867.70	75.0000
2016-04-14/12:48:20	1	3411.70	66.0000
2016-04-14/13:07:32	2	2403.00	51.0000
2016-04-14/14:33:57	6	26.0000	47.0000
2016-04-14/19:47:23	1	6279.00	78.0000
2016-04-14/21:33:00	5	385.700	199.000
2016-04-15/02:37:23	1	6.75071	62.0000
2016-04-15/04:46:07	6	419.700	187.000
2016-04-15/09:32:00	1	5.79326	15.0000
2016-04-15/16:39:36	1	11.5303	49.0000

2016-04-15/17:08:00	2	6.25368	6.00000
2016-04-15/18:39:18	6	1428.30	430.000
2016-04-16/06:40:30	1	15005.6	57.0000
2016-04-16/07:02:54	2	15005.6	65.0000
2016-04-16/20:44:39	1	9.16646	20.0000
2016-04-16/21:07:58	2	13.4359	25.0000
2016-04-17/10:35:22	1	39.1969	146.000
2016-04-17/11:11:00	2	28.8668	48.0000
2016-04-17/17:45:18	1	4.26649	6.00000
2016-04-17/18:04:00	2	6.25368	2.00000
2016-04-18/00:28:19	1	3.14208	3.00000
2016-04-18/01:07:18	2	3.66137	2.00000
2016-04-18/07:58:10	1	7.40000	53.0000
2016-04-18/08:42:59	5	3.20000	58.0000
2016-04-18/14:57:58	2	40.1000	85.0000
2016-04-18/21:57:05	2	26.0000	63.0000
2016-04-18/22:44:16	5	84.2137	46.0000
2016-04-19/05:00:52	2	5.30000	56.0000
2016-04-19/05:48:20	5	84.2137	43.0000
2016-04-19/18:41:01	1	9.89498	12.0000
2016-04-19/19:03:19	2	13.4359	16.0000
2016-04-19/20:33:56	6	57.4536	166.000
2016-04-20/01:45:01	1	3.39180	5.00000
2016-04-20/02:06:19	2	2.91075	0.00000
2016-04-20/02:29:18	3	2.14364	0.00000
2016-04-20/03:38:52	6	6845.60	82.0000
2016-04-20/08:32:40	1	11.5303	16.0000
2016-04-20/09:07:38	2	11.5303	23.0000
2016-04-20/10:48:47	6	8148.90	63.0000
2016-04-20/15:20:23	1	22.9488	61.0000
2016-04-20/16:01:59	2	9.89498	21.0000
2016-04-20/16:22:41	3	5.36673	2.00000
2016-04-20/17:50:59	6	309.034	0.00000
2016-04-20/22:45:21	1	13.4359	29.0000
2016-04-20/23:06:39	2	9.16646	34.0000
2016-04-21/06:08:23	2	13.7000	5739.00
2016-04-21/07:37:56	6	3.95237	3.00000
2016-04-21/12:39:37	1	1.17376	1.00000
2016-04-21/13:07:20	2	1.17376	0.00000
2016-04-21/14:38:35	6	1201.70	62.0000
2016-04-21/20:05:34	2	13.7000	18505.0
2016-04-22/02:30:09	1	43.8000	56.0000
2016-04-22/03:11:46	2	33.7000	58.0000
2016-04-22/04:58:21	6	78.0135	57.0000
2016-04-22/10:01:13	2	9.50000	87.0000
2016-04-22/16:29:48	1	3.20000	59.0000
2016-04-22/23:22:56	1	15005.6	48.0000
2016-04-23/00:04:32	2	15005.6	55.0000
2016-04-23/06:25:58	1	28.8668	174.000
2016-04-23/06:57:39	2	7.28723	3.00000
2016-04-23/07:17:00	3	9.16646	12.0000
2016-04-23/07:26:59	4	10.6814	10.0000
2016-04-23/09:06:55	6	1.70417	1.00000

2016-04-23/13:34:18	1	1050.55	2.00000
2016-04-23/14:06:02	2	360.108	0.00000
2016-04-23/14:44:21	5	419.623	4.00000
2016-04-23/20:29:58	1	3.66137	5.00000
2016-04-23/22:47:19	6	1.17376	1.00000
2016-04-24/03:31:19	1	15005.6	95.0000
2016-04-25/00:37:03	1	3128.30	2040.00
2016-04-25/01:05:51	2	3128.30	70.0000
2016-04-25/02:50:41	6	5.36673	12.0000
2016-04-25/15:06:46	2	20.0000	4570.00
2016-04-25/16:39:00	6	1321.47	0.00000
2016-04-25/21:39:43	1	15005.6	250.000
2016-04-25/22:05:19	2	9701.60	87.0000
2016-04-26/05:06:26	2	17.9000	2101.00
2016-04-26/11:56:38	1	13.7000	57.0000
2016-04-26/12:19:02	2	13.7000	412.000
2016-04-26/12:28:38	3	20.0000	121.000
2016-04-26/13:33:40	6	24.7727	140.000
2016-04-26/18:37:13	1	15005.6	65.0000
2016-04-26/19:06:02	2	15005.6	53.0000
2016-04-26/20:24:02	6	569.786	7.00000
2016-04-27/01:38:51	1	8896.90	91.0000
2016-04-27/02:01:15	2	4839.60	75.0000
2016-04-27/03:27:40	6	3717.60	79.0000
2016-04-27/23:00:39	2	72.2698	29.0000
2016-04-28/07:40:38	6	12.4467	42.0000
2016-04-28/12:21:40	1	5.79326	6.00000
2016-04-28/12:58:59	2	6.75071	5.00000
2016-04-28/19:24:45	1	9701.60	80.0000
2016-04-28/19:59:57	2	8896.90	96.0000
2016-04-29/02:57:53	2	3.20000	54.0000
2016-04-29/03:35:39	5	360.108	1.00000
2016-04-29/09:26:18	1	143.838	163.000
2016-04-29/09:52:01	2	2.49792	2.00000
2016-04-29/11:56:05	6	2403.00	178.000
2016-04-29/23:30:19	1	42.3121	111.000
2016-04-29/23:55:21	2	33.6376	80.0000
2016-04-30/01:39:19	6	1.35479	2.00000
2016-04-30/06:23:59	1	1.57870	0.00000
2016-04-30/13:17:20	1	98.1317	57.0000
2016-04-30/13:56:19	2	28.8668	69.0000
2016-04-30/20:17:18	1	28.8668	83.0000
2016-04-30/20:58:38	2	12.4467	27.0000
2016-04-30/22:45:07	6	10585.6	66.0000
2016-05-01/03:58:01	2	13.7000	2414.00
2016-05-01/10:30:20	1	15005.6	60.0000
2016-05-01/10:55:57	2	15005.6	55.0000
2016-05-01/17:55:44	2	3.20000	38.0000
2016-05-02/00:28:31	1	33.7000	96.0000
2016-05-02/00:54:07	2	26.0000	83.0000
2016-05-02/02:42:56	6	1099.70	52.0000
2016-05-02/07:26:26	1	1009.00	304.000
2016-05-02/07:58:26	2	850.300	68.0000

2016-05-02/09:56:51	6	419.700	65.0000
2016-05-02/14:19:34	1	419.700	98.0000
2016-05-02/14:54:46	2	329.000	266.000
2016-05-02/16:51:38	6	1.83961	1.00000
2016-05-02/21:56:31	2	7.40000	77.0000
2016-05-02/22:34:55	5	3.20000	67.0000
2016-05-02/23:34:37	6	33.6376	53.0000
2016-05-03/04:26:19	1	3.39180	20.0000
2016-05-03/04:56:40	2	2.91075	1.00000
2016-05-03/11:19:02	1	499.000	91.0000
2016-05-03/12:00:38	2	272.300	48.0000
2016-05-03/12:13:26	3	295.000	84.0000
2016-05-03/12:23:02	4	159.000	70.0000
2016-05-03/12:35:50	5	159.000	61.0000
2016-05-03/13:23:51	6	1859.00	214.000
2016-05-03/18:25:13	1	2629.70	169.000
2016-05-03/18:57:14	2	1700.30	67.0000
2016-05-04/01:24:01	1	36.3110	126.000
2016-05-04/01:55:38	2	14.5038	105.000
2016-05-04/03:41:10	6	714.300	454.000
2016-05-04/08:21:59	1	14.5038	95.0000
2016-05-04/08:54:20	2	7.86639	10.0000
2016-05-04/15:19:40	1	3.66137	11.0000
2016-05-04/15:58:39	2	2.14364	1.00000
2016-05-04/22:16:59	1	569.786	4.00000
2016-05-04/22:58:59	2	360.108	2.00000
2016-05-05/05:24:20	1	167.611	193.000
2016-05-05/05:53:40	2	195.311	6.00000
2016-05-06/16:24:19	1	143.838	29.0000
2016-05-06/16:52:39	2	98.1317	35.0000
2016-05-07/06:27:01	1	155.270	41.0000
2016-05-07/06:48:39	2	98.1317	9.00000
2016-05-07/13:50:48	2	15.8000	5273.00
2016-05-08/03:42:35	2	15.8000	275.000
2016-05-08/10:21:18	1	918.300	203.000
2016-05-08/10:56:31	2	771.000	68.0000
2016-05-08/17:52:50	2	56.9000	65.0000
2016-05-09/00:17:41	1	16.9008	62.0000
2016-05-09/00:55:40	2	15.6565	39.0000
2016-05-09/07:28:43	1	28.8668	211.000
2016-05-09/07:52:58	2	19.6940	133.000
2016-05-09/14:21:20	1	3.66137	4.00000
2016-05-09/14:54:21	2	2.31401	1.00000
2016-05-09/21:03:00	1	2.49792	29.0000
2016-05-09/21:53:38	2	1.98581	2.00000
2016-05-10/11:06:54	1	9701.60	77.0000
2016-05-10/11:51:43	2	6279.00	54.0000
2016-05-10/18:19:14	1	7469.00	109.000
2016-05-10/18:51:14	2	6845.60	72.0000
2016-05-11/08:20:53	1	499.000	104.000
2016-05-11/08:49:41	2	385.700	86.0000
2016-05-11/15:54:01	2	15.8000	1887.00
2016-05-11/22:50:59	2	26.7415	53.0000

2016-05-12/05:40:32	2	7.40000	51.0000
2016-05-12/12:51:53	2	62.1000	81.0000
2016-05-13/02:14:24	1	62.1000	64.0000
2016-05-13/02:46:24	2	47.8000	127.000
2016-05-13/09:17:23	1	43.8000	66.0000
2016-05-13/09:39:48	2	36.8000	101.000
2016-05-13/16:44:41	2	5.30000	77.0000
2016-05-13/22:55:18	1	19.6940	27.0000
2016-05-13/23:38:38	2	6.25368	5.00000
2016-05-14/01:15:09	6	385.700	65.0000
2016-05-14/06:11:20	1	2.91075	5.00000
2016-05-14/06:38:19	2	3.66137	1.00000
2016-05-14/13:09:18	1	14.5038	33.0000
2016-05-14/13:41:38	2	7.28723	4.00000
2016-05-14/20:05:59	1	1.35479	0.00000
2016-05-14/20:45:39	2	1.46247	2.00000
2016-05-15/02:56:42	1	15005.6	61.0000
2016-05-15/03:44:01	2	1.25505	1.00000
2016-05-15/10:06:06	1	544.300	284.000
2016-05-15/10:41:18	2	646.300	143.000
2016-05-15/17:09:05	1	10585.6	54.0000
2016-05-15/17:47:30	2	1700.30	70.0000
2016-05-15/18:16:18	3	2867.70	74.0000
2016-05-16/00:07:37	1	1859.00	141.000
2016-05-16/00:49:13	2	3128.30	75.0000
2016-05-16/07:08:18	1	1.98581	3.00000
2016-05-16/07:46:21	2	1.35479	0.00000
2016-05-16/14:46:40	2	7.40000	69.0000
2016-05-16/21:48:31	2	47.8000	135.000
2016-05-17/04:08:02	1	136.300	78.0000
2016-05-17/04:43:14	2	159.000	83.0000
2016-05-17/10:45:26	1	125.000	76.0000
2016-05-17/18:49:58	2	3064.79	2.00000
2016-05-18/01:50:55	2	13.7000	606.000
2016-05-18/08:03:57	1	22.9488	93.0000
2016-05-18/14:54:14	1	6279.00	280.000
2016-05-18/15:51:50	2	1428.30	74.0000
2016-05-18/21:55:52	1	1700.30	452.000
2016-05-18/22:43:38	2	57.4536	51.0000
2016-05-19/05:04:00	1	42.3121	555.000
2016-05-19/05:42:19	2	7.86639	1.00000
2016-05-19/07:08:13	6	15005.6	61.0000
2016-05-19/12:07:59	1	26.7415	121.000
2016-05-19/12:44:38	2	22.9488	89.0000
2016-05-20/09:03:43	1	4.97160	14.0000
2016-05-20/09:44:18	2	4.60557	1.00000
2016-05-20/15:57:00	1	7.28723	24.0000
2016-05-20/16:51:19	2	7.86639	18.0000
2016-05-20/22:58:58	1	3.95237	9.00000
2016-05-20/23:39:21	2	5.79326	4.00000
2016-05-21/00:27:17	5	1.00000	57.0000
2016-05-21/05:55:36	1	1201.70	295.000
2016-05-21/06:43:37	2	1428.30	102.000

2016-05-21/07:15:37	5	5.30000	61.0000
2016-05-21/08:13:13	6	52.1000	71.0000
2016-05-21/12:55:37	1	105.931	1181.00
2016-05-21/13:40:12	2	227.000	72.0000
2016-05-22/03:48:05	2	36.8000	661.000
2016-05-22/05:36:54	6	15005.6	67.0000
2016-05-22/09:58:00	1	13747.6	54.0000
2016-05-22/10:42:49	2	12602.9	57.0000
2016-05-22/11:05:56	5	49.3050	88.0000
2016-05-22/16:49:01	1	28.8668	443.000
2016-05-22/17:45:48	2	12602.9	70.0000
2016-05-23/06:53:10	1	7469.00	69.0000
2016-05-23/07:41:11	2	5757.60	73.0000
2016-05-23/09:21:58	6	2.91075	5.00000
2016-05-24/17:55:05	1	43.8000	56.0000
2016-05-24/18:43:06	2	73.9000	65.0000
2016-05-25/01:39:39	2	17.9000	4531.00
2016-05-25/02:24:27	5	3.20000	100.000
2016-05-25/08:42:54	2	3.20000	64.0000
2016-05-25/15:39:14	2	28.3000	104.000
2016-05-25/17:34:27	6	5.30000	60.0000
2016-05-25/21:34:58	1	3.20000	93.0000
2016-05-26/19:31:51	2	5.30000	73.0000
2016-05-27/01:28:21	1	90.9067	619.000
2016-05-27/23:37:21	2	26.0000	179.000
2016-05-28/00:02:57	6	9.50000	79.0000
2016-05-28/05:44:59	1	195.311	9.00000
2016-05-28/06:32:41	2	90.9067	20.0000
2016-05-28/20:33:32	2	21.8000	786.000
2016-05-28/22:08:56	6	286.282	7.00000
2016-05-29/03:33:15	2	9.50000	65.0000
2016-05-29/04:08:27	5	5.30000	67.0000
2016-05-29/05:47:40	6	11.6000	76.0000
2016-05-30/00:58:03	5	1.00000	76.0000
2016-05-30/02:37:16	6	15005.6	67.0000
2016-05-30/06:41:02	1	15005.6	81.0000
2016-05-30/07:38:39	2	15005.6	59.0000
2016-05-30/09:46:18	6	33.6376	235.000
2016-05-30/14:35:14	2	13.7000	53.0000
2016-05-30/14:59:58	5	227.590	7.00000
2016-05-30/16:25:22	6	195.311	89.0000
2016-05-30/21:28:38	2	5.30000	46.0000
2016-05-30/22:03:50	5	3.20000	54.0000
2016-05-31/04:34:47	2	5.30000	79.0000
2016-05-31/17:54:01	1	8.49158	17.0000
2016-05-31/18:28:59	2	4.97160	1.00000
2016-06-01/01:33:54	2	13.7000	352.000
2016-06-01/02:02:58	5	84.2137	2.00000
2016-06-01/07:32:48	1	12602.9	76.0000
2016-06-01/08:33:37	2	2629.70	235.000
2016-06-01/09:05:37	5	11.6000	100.000
2016-06-01/10:12:50	6	193.000	82.0000
2016-06-01/14:28:18	1	105.931	21.0000

2016-06-01/15:29:59	2	39.1969	43.0000
2016-06-01/16:02:01	3	31.1610	110.000
2016-06-01/16:56:20	4	36.3110	232.000
2016-06-01/22:30:00	2	1009.00	112.000
2016-06-02/05:36:19	2	7.40000	94.0000
2016-06-02/11:03:18	1	56.9000	65.0000
2016-06-02/12:36:07	2	23.8000	1209.00
2016-06-02/19:23:06	2	5.30000	43.0000
2016-06-02/19:58:18	5	3.20000	66.0000
2016-06-03/02:29:05	2	7.40000	53.0000
2016-06-03/16:25:51	2	9.50000	100.000
2016-06-03/17:01:03	5	3.20000	93.0000
2016-06-03/22:02:10	1	15005.6	64.0000
2016-06-03/23:22:10	2	15005.6	47.0000
2016-06-04/13:26:00	2	155.270	7.00000
2016-06-04/13:28:04	2	7.40000	55.0000
2016-06-04/20:59:37	5	4.97160	2.00000
2016-06-04/22:13:20	6	8.49158	6.00000
2016-06-05/03:24:19	2	385.700	327.000
2016-06-05/03:59:31	5	23.8000	405.000
2016-06-05/10:24:06	2	9.50000	39.0000
2016-06-06/00:14:01	2	17.9000	426.000
2016-06-06/00:58:49	5	5.30000	88.0000
2016-06-06/07:20:28	2	9.50000	74.0000
2016-06-06/14:29:36	2	15.8000	67.0000
2016-06-06/15:01:36	5	17.9000	294.000
2016-06-07/04:29:07	1	15.8000	121.000
2016-06-07/10:18:42	1	45.6749	557.000
2016-06-07/11:28:01	2	6.25368	12.0000
2016-06-08/01:28:30	2	7.40000	58.0000
2016-06-08/01:54:06	5	15.8000	213.000
2016-06-08/08:31:31	2	73.9000	75.0000
2016-06-08/15:28:06	2	20.0000	204.000
2016-06-08/16:00:07	5	13.7000	75.0000
2016-06-08/22:31:06	2	28.3000	150.000
2016-06-08/22:53:30	5	5.30000	57.0000
2016-06-09/00:29:31	6	419.700	78.0000
2016-06-09/05:30:38	2	21.8000	124.000
2016-06-09/05:56:14	5	13.7000	105.000
2016-06-09/12:20:49	2	15.8000	83.0000
2016-06-09/17:54:58	1	3.14208	4.00000
2016-06-09/19:17:01	2	2.91075	2.00000
2016-06-09/19:59:17	5	9.50000	59.0000
2016-06-10/02:17:12	2	9.50000	37.0000
2016-06-10/02:55:36	5	67.7000	74.0000
2016-06-10/09:17:00	2	36.8000	81.0000
2016-06-10/09:54:19	5	1794.36	0.00000
2016-06-10/11:09:40	6	615.070	0.00000
2016-06-10/23:13:22	2	36.8000	58.0000
2016-06-10/23:45:23	5	9.50000	77.0000
2016-06-11/06:22:41	2	7.40000	62.0000
2016-06-11/06:54:41	5	5.30000	67.0000
2016-06-11/07:49:06	6	26.0000	76.0000

2016-06-11/11:55:20	1	7.86639	16.0000
2016-06-11/13:13:38	2	1.83961	0.00000
2016-06-11/14:52:41	6	2.31401	4.00000
2016-06-11/20:15:52	2	40.1000	90.0000
2016-06-11/20:57:28	5	329.000	60.0000
2016-06-11/21:48:41	6	1859.00	138.000
2016-06-12/03:22:03	2	30.9000	560.000
2016-06-12/03:50:51	5	181.700	146.000
2016-06-12/11:33:20	6	7.28723	26.0000
2016-06-13/00:21:21	2	40.1000	87.0000
2016-06-13/02:27:01	6	24.7727	104.000
2016-06-13/07:24:20	2	17.9000	71.0000
2016-06-14/04:30:05	2	52.1000	232.000
2016-06-14/04:46:05	5	1303.70	245.000
2016-06-14/11:29:53	2	329.000	79.0000
2016-06-14/11:45:53	5	544.300	145.000
2016-06-14/13:15:29	6	3717.60	228.000
2016-06-14/18:26:28	2	5.30000	47.0000
2016-06-14/19:43:17	6	11.6000	54.0000
2016-06-15/02:28:00	6	286.282	131.000
2016-06-15/22:22:25	2	20.0000	54.0000
2016-06-16/05:12:35	2	15.8000	109.000
2016-06-16/12:18:57	2	193.000	161.000
2016-06-17/03:33:39	6	13.4359	39.0000
2016-06-18/13:43:13	6	2867.70	65.0000
2016-06-18/20:23:32	2	5.30000	61.0000
2016-06-18/20:52:20	4	20.0000	2363.00
2016-06-19/10:19:52	2	30.9000	302.000
2016-06-19/10:42:17	5	40.1000	45.0000
2016-06-21/04:40:43	5	5.30000	69.0000
2016-06-21/05:31:56	6	6279.00	70.0000
2016-06-21/11:14:54	2	5.30000	44.0000
2016-06-21/11:43:43	5	26.0000	210.000
2016-06-21/12:41:19	6	215.700	56.0000
2016-06-21/18:37:06	5	385.700	87.0000
2016-06-21/20:13:07	6	2629.70	142.000
2016-06-22/01:40:06	5	11.6000	57.0000
2016-06-22/08:10:49	2	11.6000	1249.00
2016-06-22/15:42:37	5	249.700	312.000
2016-06-22/22:16:32	2	11.6000	73.0000
2016-06-22/23:20:33	6	2867.70	208.000
2016-06-23/05:35:32	5	87.9000	80.0000
2016-06-23/06:13:56	6	419.700	72.0000
2016-06-23/12:41:37	5	23.8000	98.0000
2016-06-23/13:29:38	6	159.000	78.0000
2016-06-23/19:35:01	5	3.20000	59.0000
2016-06-23/20:55:01	6	80.6000	56.0000
2016-06-24/02:44:24	5	43.8000	57.0000
2016-06-24/10:16:20	6	167.611	6.00000
2016-06-24/23:17:52	2	47.8000	86.0000
2016-06-24/23:40:16	5	9.50000	50.0000
2016-06-25/01:09:53	6	1303.70	788.000
2016-06-25/13:37:00	5	90.9067	9.00000

2016-06-25/14:34:01	6	98.1317	19.0000
2016-06-25/20:32:55	5	15.8000	53.0000
2016-06-25/21:20:55	6	80.6000	67.0000
2016-06-26/03:35:55	5	918.300	59.0000
2016-06-26/10:35:42	5	351.700	62.0000
2016-06-26/11:36:31	6	1428.30	109.000
2016-06-26/17:12:50	4	23.8000	71.0000
2016-06-26/17:38:26	5	23.8000	55.0000
2016-06-26/18:42:26	6	62.1000	59.0000
2016-06-27/00:44:25	4	28.3000	70.0000
2016-06-27/07:31:25	5	1099.70	64.0000
2016-06-27/14:37:36	5	17.9000	56.0000
2016-06-27/21:27:41	5	385.700	90.0000
2016-06-27/22:47:42	6	601.000	96.0000
2016-06-28/04:33:53	5	11.6000	64.0000
2016-06-28/05:21:53	6	43.8000	74.0000
2016-06-28/11:30:28	5	7.40000	48.0000
2016-06-29/02:23:57	6	8896.90	85.0000
2016-06-30/19:59:52	6	159.000	50.0000
2016-07-01/02:37:16	5	23.8000	82.0000
2016-07-01/03:28:28	6	714.300	570.000
2016-07-01/09:56:05	6	1428.30	87.0000
2016-07-01/23:26:52	5	714.300	59.0000
2016-07-02/06:29:52	5	23.8000	253.000
2016-07-02/13:22:57	5	62.1000	199.000
2016-07-02/13:51:45	6	272.300	424.000
2016-07-03/03:22:16	5	147.700	73.0000
2016-07-03/04:00:41	6	329.000	465.000
2016-07-03/10:22:04	5	23.8000	64.0000
2016-07-03/10:57:16	6	125.000	57.0000
2016-07-04/21:27:01	5	36.8000	75.0000
2016-07-05/05:27:37	6	249.700	50.0000
2016-07-05/11:23:24	4	295.000	128.000
2016-07-05/11:52:13	5	714.300	92.0000
2016-07-06/01:22:43	5	26.0000	93.0000
2016-07-06/01:57:55	6	52.1000	69.0000
2016-07-06/08:35:19	5	419.700	94.0000
2016-07-06/08:57:43	6	15005.6	65.0000
2016-07-06/15:22:02	5	40.1000	218.000
2016-07-06/15:50:50	6	272.300	67.0000
2016-07-06/22:28:14	5	385.700	99.0000
2016-07-06/22:41:02	6	646.300	116.000
2016-07-07/05:24:35	5	33.7000	75.0000
2016-07-07/05:50:11	6	181.700	100.000
2016-07-07/12:21:11	5	3717.60	74.0000
2016-07-07/12:53:11	6	7469.00	42.0000
2016-07-07/19:14:34	5	95.9000	178.000
2016-07-07/19:46:34	6	499.000	597.000
2016-07-08/02:14:22	5	193.000	111.000
2016-07-08/02:55:58	6	850.300	1954.00
2016-07-08/09:10:01	5	72.2698	37.0000
2016-07-08/10:00:19	6	227.590	79.0000
2016-07-09/06:16:38	5	5.36673	4.00000

2016-07-09/07:01:19	6	15.6565	25.0000
2016-07-09/20:44:31	6	227.000	58.0000
2016-07-10/03:18:42	5	11548.9	50.0000
2016-07-10/03:47:30	6	15005.6	50.0000
2016-07-10/10:15:58	5	1.35479	0.00000
2016-07-10/10:51:40	6	3.66137	6.00000
2016-07-10/17:16:19	5	24.7727	65.0000
2016-07-10/17:40:38	6	42.3121	208.000
2016-07-11/00:14:33	5	601.000	63.0000
2016-07-11/00:46:33	6	2629.70	127.000
2016-07-11/06:10:04	2	5.30000	55.0000
2016-07-11/06:22:52	3	7.40000	52.0000
2016-07-11/06:54:52	4	7.40000	50.0000
2016-07-11/07:14:04	5	7.40000	47.0000
2016-07-11/08:30:53	6	419.700	62.0000
2016-07-12/11:28:57	5	13.4359	29.0000
2016-07-12/11:57:01	6	28.8668	58.0000
2016-07-12/18:15:57	5	56.9000	51.0000
2016-07-12/18:35:09	6	95.9000	49.0000
2016-07-13/08:08:59	5	30.9000	120.000
2016-07-13/09:16:11	6	2210.30	141.000
2016-07-13/15:15:10	5	43.8000	46.0000
2016-07-13/15:47:11	6	771.000	58.0000
2016-07-13/22:18:10	5	918.300	65.0000
2016-07-13/22:40:34	6	15005.6	63.0000
2016-07-14/11:51:54	4	7.40000	46.0000
2016-07-14/12:07:55	5	9.50000	295.000
2016-07-14/12:46:19	6	136.300	61.0000
2016-07-14/18:54:54	4	15.8000	2271.00
2016-07-14/19:14:06	5	33.7000	64.0000
2016-07-14/19:30:06	6	95.9000	46.0000
2016-07-15/09:10:07	5	249.700	106.000
2016-07-15/16:09:55	5	9.50000	48.0000
2016-07-15/16:32:19	6	113.700	58.0000
2016-07-15/23:12:54	5	26.0000	158.000
2016-07-15/23:38:30	6	193.000	64.0000
2016-07-16/13:12:11	5	351.700	117.000
2016-07-16/13:44:11	6	2629.70	163.000
2016-07-16/20:11:59	5	80.6000	69.0000
2016-07-17/03:18:10	5	159.000	55.0000
2016-07-17/09:36:06	2	5.30000	30.0000
2016-07-17/09:48:54	3	11.6000	42.0000
2016-07-17/10:08:06	4	11.6000	90.0000
2016-07-17/10:36:54	5	43.8000	50.0000
2016-07-17/17:07:55	5	646.300	72.0000
2016-07-17/17:33:31	6	3128.30	149.000
2016-07-18/14:08:06	5	1.00000	43.0000
2016-07-18/14:33:42	6	2867.70	50.0000
2016-07-19/03:00:24	2	11.6000	93.0000
2016-07-19/03:35:36	3	21.8000	33.0000
2016-07-19/03:48:24	4	28.3000	26.0000
2016-07-19/04:14:01	5	43.8000	93.0000
2016-07-19/04:36:25	6	125.000	69.0000

2016-07-19/11:07:24	5	13.7000	49.0000
2016-07-19/18:12:19	5	385.700	99.0000
2016-07-19/18:31:31	6	1553.00	146.000
2016-07-20/01:43:41	6	14.5038	55.0000
2016-07-20/15:12:46	5	95.9000	59.0000
2016-07-20/15:38:22	6	419.700	44.0000
2016-07-20/21:58:19	4	5.30000	76.0000
2016-07-20/22:04:43	5	9.50000	151.000
2016-07-20/22:23:55	6	499.000	126.000
2016-07-21/11:52:34	4	544.300	55.0000
2016-07-21/12:02:10	5	714.300	131.000
2016-07-21/12:34:10	6	1700.30	97.0000
2016-07-22/09:07:53	5	5.30000	52.0000
2016-07-23/20:09:40	5	36.8000	61.0000
2016-07-23/20:28:52	6	43.8000	43.0000
2016-07-24/02:53:12	4	11.6000	235.000
2016-07-24/03:06:00	5	15.8000	562.000
2016-07-24/03:25:12	6	43.8000	45.0000
2016-07-24/09:48:25	4	5.30000	64.0000
2016-07-24/10:04:25	5	7.40000	66.0000
2016-07-24/10:20:25	6	11.6000	70.0000
2016-07-24/17:02:05	5	20.0000	849.000
2016-07-26/03:51:08	5	5.30000	35.0000
2016-07-26/04:19:56	6	56.9000	42.0000
2016-07-26/17:46:01	4	9.50000	49.0000
2016-07-26/17:58:49	5	9.50000	96.0000
2016-07-26/18:21:13	6	125.000	65.0000
2016-07-27/00:59:57	5	714.300	194.000
2016-07-27/01:22:21	6	6279.00	55.0000
2016-07-27/07:45:22	5	19.6940	70.0000
2016-07-27/07:59:38	6	24.7727	106.000
2016-07-27/08:18:40	7	39.1969	1282.00
2016-07-27/14:59:16	5	47.8000	50.0000
2016-07-27/15:28:04	6	125.000	69.0000
2016-07-27/22:04:09	5	15.8000	87.0000
2016-07-27/22:29:45	6	62.1000	65.0000
2016-07-28/04:46:04	4	11.6000	129.000
2016-07-28/04:58:53	5	20.0000	108.000
2016-07-28/05:18:05	6	87.9000	80.0000
2016-07-28/18:56:47	5	28.3000	790.000
2016-07-28/19:15:59	6	62.1000	59.0000
2016-07-29/08:46:39	4	3.20000	77.0000
2016-07-29/08:59:27	5	5.30000	75.0000
2016-07-29/09:18:39	6	43.8000	78.0000
2016-07-29/15:41:22	4	36.8000	42.0000
2016-07-29/15:57:23	5	62.1000	84.0000
2016-07-29/16:16:35	6	465.000	47.0000
2016-07-29/23:16:22	6	385.700	267.000
2016-07-31/09:44:37	4	11.6000	1318.00
2016-07-31/10:00:37	5	17.9000	369.000
2016-07-31/16:52:09	5	1303.70	58.0000
2016-07-31/17:11:21	6	4431.60	53.0000
2016-07-31/23:58:04	5	17.9000	50.0000

2016-08-01/00:14:04	6	544.300	123.000
2016-08-02/10:39:25	4	125.000	76.0000
2016-08-02/10:52:13	5	147.700	105.000
2016-08-02/11:11:25	6	351.700	230.000
2016-08-03/00:54:53	5	1428.30	218.000
2016-08-03/01:26:53	6	3717.60	450.000
2016-08-03/14:07:32	2	7.40000	34.0000
2016-08-03/14:17:08	3	9.50000	54.0000
2016-08-03/14:39:32	4	13.7000	48.0000
2016-08-03/14:55:32	5	28.3000	63.0000
2016-08-03/15:17:56	6	227.000	48.0000
2016-08-03/22:16:19	6	1.17376	5.00000
2016-08-04/17:49:08	2	13.7000	227.000
2016-08-04/18:24:21	3	21.8000	192.000
2016-08-04/18:40:21	4	28.3000	50.0000
2016-08-04/19:15:38	6	4.60557	4.00000
2016-08-04/23:02:58	1	19.6940	51.0000
2016-08-05/00:56:24	2	11.6000	134.000
2016-08-05/01:09:12	3	15.8000	44.0000
2016-08-05/01:31:36	4	20.0000	33.0000
2016-08-05/01:54:01	5	21.8000	600.000
2016-08-05/02:19:37	6	73.9000	50.0000
2016-08-05/22:08:30	3	3.20000	40.0000
2016-08-05/22:30:55	4	7.40000	20.0000
2016-08-05/22:46:55	5	13.7000	86.0000
2016-08-05/23:12:31	6	181.700	51.0000
2016-08-06/05:52:50	5	272.300	62.0000
2016-08-06/06:08:50	6	850.300	113.000
2016-08-06/10:22:37	1	1.35479	3.00000
2016-08-06/12:46:14	5	11.6000	449.000
2016-08-06/13:08:38	6	385.700	60.0000
2016-08-06/19:51:07	5	5.30000	82.0000
2016-08-06/20:10:19	6	52.1000	75.0000
2016-08-07/00:15:57	1	62.0198	248.000
2016-08-07/02:07:10	3	7.40000	34.0000
2016-08-07/02:29:34	4	13.7000	51.0000
2016-08-07/02:45:35	5	13.7000	786.000
2016-08-07/03:04:47	6	33.7000	37.0000
2016-08-07/16:12:54	3	7.40000	37.0000
2016-08-07/16:25:42	4	9.50000	21.0000
2016-08-07/23:53:05	5	136.300	76.0000
2016-08-08/11:16:55	1	15005.6	46.0000
2016-08-08/14:09:44	6	15005.6	52.0000
2016-08-08/20:47:08	5	7.40000	42.0000
2016-08-09/03:35:57	4	11.6000	14072.0
2016-08-09/03:45:33	5	15.8000	2876.00
2016-08-09/04:17:33	6	499.000	57.0000
2016-08-09/09:36:16	2	5.30000	73.0000
2016-08-09/11:09:05	6	2629.70	146.000
2016-08-09/16:55:00	2	23.8000	84.0000
2016-08-09/17:07:48	3	28.3000	35.0000
2016-08-10/01:08:24	6	40.1000	42.0000
2016-08-10/07:06:01	3	147.700	74.0000

2016-08-10/07:28:25	4	272.300	326.000
2016-08-10/07:44:25	5	465.000	45.0000
2016-08-10/08:00:25	6	1303.70	307.000
2016-08-10/19:21:03	1	1009.00	120.000
2016-08-10/20:57:04	2	43.8000	44.0000
2016-08-10/21:41:52	5	1.00000	39.0000
2016-08-10/22:04:16	6	17.9000	47.0000
2016-08-11/04:48:04	5	87.9000	41.0000
2016-08-11/05:07:16	6	918.300	147.000
2016-08-11/11:43:15	5	47.8000	84.0000
2016-08-11/12:02:27	6	125.000	81.0000
2016-08-11/17:56:22	3	56.9000	45.0000
2016-08-11/18:12:22	4	87.9000	34.0000
2016-08-11/18:59:59	6	3308.37	0.00000
2016-08-12/07:31:58	2	15.8000	632.000
2016-08-12/08:48:47	5	23.8000	80.0000
2016-08-12/14:36:18	2	7.40000	55.0000
2016-08-12/15:08:18	3	13.7000	51.0000
2016-08-12/15:59:31	6	73.9000	55.0000
2016-08-13/05:47:53	5	1859.00	76.0000
2016-08-13/06:03:53	6	5757.60	61.0000
2016-08-14/02:42:03	5	43.8000	60.0000
2016-08-14/02:58:03	6	73.9000	52.0000
2016-08-14/06:58:21	1	7.40000	59.0000
2016-08-14/10:07:10	6	193.000	61.0000
2016-08-14/15:45:41	3	1.00000	114.000
2016-08-14/16:01:41	4	3.20000	43.0000
2016-08-14/16:36:53	5	5.30000	102.000
2016-08-14/16:59:17	6	9.50000	52.0000
2016-08-14/21:25:19	1	133.248	11.0000
2016-08-15/00:01:13	6	2867.70	207.000
2016-08-15/06:57:32	6	1009.00	311.000
2016-08-15/11:20:31	1	6845.60	62.0000
2016-08-16/02:46:24	2	7.40000	52.0000
2016-08-16/22:06:21	1	13747.6	43.0000
2016-08-17/05:12:17	1	1553.00	128.000
2016-08-17/14:21:11	4	11.6000	1051.00
2016-08-17/14:37:11	5	20.0000	93.0000
2016-08-17/14:59:35	6	47.8000	65.0000
2016-08-17/19:16:38	1	114.350	550.000
2016-08-18/01:53:18	1	2.91075	1.00000
2016-08-18/05:01:19	6	9.16646	113.000
2016-08-18/09:23:00	1	4.26649	14.0000
2016-08-18/12:00:50	6	17.9000	47.0000
2016-08-18/18:26:25	4	5.30000	48.0000
2016-08-18/18:39:13	5	9.50000	145.000
2016-08-18/18:58:25	6	47.8000	83.0000
2016-08-20/03:14:20	1	31.1610	300.000
2016-08-20/05:33:26	5	7.40000	61.0000
2016-08-20/05:49:26	6	21.8000	45.0000
2016-08-21/09:35:30	5	52.1000	215.000
2016-08-21/09:54:42	6	215.700	52.0000
2016-08-21/21:19:20	1	39.1969	496.000

2016-08-21/23:19:00	4	3.20000	42.0000
2016-08-21/23:38:13	5	9.50000	72.0000
2016-08-21/23:54:13	6	295.000	56.0000
2016-08-22/04:29:58	1	3.95237	8.00000
2016-08-22/06:05:44	4	28.3000	55.0000
2016-08-22/06:34:32	5	67.7000	106.000
2016-08-22/06:53:44	6	714.300	80.0000
2016-08-22/13:35:29	5	385.700	348.000
2016-08-22/13:51:29	6	646.300	217.000
2016-08-22/18:36:00	1	62.0198	188.000
2016-08-22/19:55:48	3	329.000	44.0000
2016-08-22/20:11:48	4	499.000	39.0000
2016-08-22/20:50:13	6	8148.90	52.0000
2016-08-23/01:14:40	1	527.835	3.00000
2016-08-23/03:33:44	5	73.9000	66.0000
2016-08-23/09:40:09	2	9.50000	147.000
2016-08-23/10:18:33	4	5.30000	43.0000
2016-08-23/10:34:33	5	15.8000	2059.00
2016-08-23/11:03:21	6	295.000	66.0000
2016-08-23/15:22:04	1	771.000	2314.00
2016-08-24/05:13:38	1	33.6376	375.000
2016-08-24/07:51:48	6	5270.30	57.0000
2016-08-24/14:52:41	6	181.700	69.0000
2016-08-24/14:52:41	7	181.700	69.0000
2016-08-24/19:10:21	1	78.0135	147.000
2016-08-24/21:09:48	4	33.7000	266.000
2016-08-24/21:32:13	5	73.9000	192.000
2016-08-24/21:51:25	6	272.300	98.0000
2016-08-25/01:54:55	1	4057.60	56.0000
2016-08-25/04:34:56	5	3.20000	32.0000
2016-08-25/04:50:56	6	13.7000	43.0000
2016-08-25/11:10:09	4	3.20000	45.0000
2016-08-25/11:32:33	5	7.40000	76.0000
2016-08-25/11:48:33	6	62.1000	79.0000
2016-08-25/18:28:05	5	21.8000	88.0000
2016-08-25/18:47:17	6	95.9000	54.0000
2016-08-25/23:25:59	1	3717.60	53.0000
2016-08-26/01:14:48	4	5.30000	30.0000
2016-08-26/01:34:00	5	9.50000	58.0000
2016-08-26/01:46:48	6	17.9000	68.0000
2016-08-26/06:12:59	1	3411.70	65.0000
2016-08-26/08:14:36	5	7.40000	46.0000
2016-08-26/08:30:36	6	15.8000	1894.00
2016-08-26/08:46:36	7	21.8000	58.0000
2016-08-26/15:15:29	5	5.30000	41.0000
2016-08-26/15:28:17	6	7.40000	75.0000
2016-08-26/15:50:41	7	30.9000	66.0000
2016-08-26/20:16:40	1	6.75071	6.00000
2016-08-26/22:30:13	5	95.9000	269.000
2016-08-27/03:23:16	1	2.14364	1.00000
2016-08-27/05:16:56	4	9.50000	42.0000
2016-08-27/05:26:32	5	13.7000	2541.00
2016-08-27/05:45:44	6	28.3000	49.0000

2016-08-27/10:11:55	1	5270.30	69.0000
2016-08-27/19:30:19	4	3.20000	96.0000
2016-08-27/19:49:31	5	13.7000	71.0000
2016-08-28/00:18:41	1	123.438	667.000
2016-08-28/07:20:20	1	143.838	34.0000
2016-08-28/08:30:58	2	7.40000	57.0000
2016-08-28/08:46:58	3	17.9000	107.000
2016-08-28/09:02:58	4	26.0000	64.0000
2016-08-28/09:31:46	5	43.8000	146.000
2016-08-28/14:10:39	1	286.282	39.0000
2016-08-28/15:40:21	2	385.700	79.0000
2016-08-28/15:56:22	3	465.000	47.0000
2016-08-28/16:15:34	4	601.000	34.0000
2016-08-28/16:28:22	5	714.300	142.000
2016-08-28/16:47:34	6	2017.70	225.000
2016-08-28/22:25:15	2	43.8000	181.000
2016-08-28/22:44:27	3	62.1000	63.0000
2016-08-28/23:03:39	4	73.9000	46.0000
2016-08-28/23:29:15	5	136.300	88.0000
2016-08-28/23:45:15	6	295.000	89.0000
2016-08-29/04:21:18	1	19.6940	107.000
2016-08-29/05:30:22	2	1859.00	59.0000
2016-08-29/05:46:22	3	2210.30	31.0000
2016-08-29/06:47:19	6	6.75071	7.00000
2016-08-29/11:24:20	1	10.6814	28.0000
2016-08-29/12:23:30	2	3.20000	33.0000
2016-08-29/13:46:42	6	6279.00	79.0000
2016-08-29/18:16:05	1	1553.00	143.000
2016-08-29/19:16:53	2	544.300	52.0000
2016-08-29/19:36:05	3	771.000	54.0000
2016-08-29/19:55:18	4	850.300	32.0000
2016-08-30/02:20:49	2	20.0000	222.000
2016-08-30/02:46:25	3	20.0000	104.000
2016-08-30/02:59:13	4	23.8000	35.0000
2016-08-30/03:28:01	5	30.9000	68.0000
2016-08-30/03:47:13	6	147.700	103.000
2016-08-31/06:22:57	2	17.9000	85.0000
2016-08-31/06:51:45	3	21.8000	105.000
2016-08-31/07:10:57	4	21.8000	3356.00
2016-08-31/07:26:57	5	30.9000	358.000
2016-08-31/12:20:52	1	10585.6	65.0000
2016-08-31/13:50:28	3	36.8000	38.0000
2016-08-31/14:12:53	4	62.1000	47.0000
2016-08-31/14:47:18	6	36.3110	89.0000
2016-08-31/19:11:00	1	53.2236	150.000
2016-08-31/20:21:00	2	9.16646	24.0000
2016-08-31/20:36:00	3	10.6814	1.00000
2016-08-31/20:59:36	4	11548.9	33.0000
2016-08-31/21:25:12	5	15005.6	41.0000
2016-08-31/21:47:40	6	1.17376	3.00000
2016-09-01/04:47:24	6	13747.6	56.0000
2016-09-01/10:25:04	2	56.9000	229.000
2016-09-01/10:37:53	3	67.7000	139.000

2016-09-01/11:06:41	4	52.1000	75.0000
2016-09-01/11:29:05	5	67.7000	64.0000
2016-09-01/11:41:53	6	419.700	161.000
2016-09-01/16:22:44	1	15005.6	31.0000
2016-09-01/17:23:32	2	5757.60	46.0000
2016-09-01/17:42:44	3	10585.6	50.0000
2016-09-01/18:24:21	5	7469.00	59.0000
2016-09-01/18:43:33	6	12602.9	56.0000
2016-09-01/23:28:41	1	105.931	73.0000
2016-09-02/00:32:56	2	5.30000	56.0000
2016-09-02/00:42:32	3	9.50000	38.0000
2016-09-02/00:58:32	4	13.7000	57.0000
2016-09-02/01:27:20	5	20.0000	54.0000
2016-09-02/01:46:32	6	80.6000	43.0000
2016-09-02/06:28:43	1	4839.60	200.000
2016-09-02/08:23:56	5	3.20000	39.0000
2016-09-02/08:46:20	6	13.7000	41.0000
2016-09-02/15:21:27	5	21.8000	232.000
2016-09-02/15:47:03	6	102.300	64.0000
2016-09-02/20:05:45	1	15005.6	51.0000
2016-09-02/22:29:47	5	95.9000	62.0000
2016-09-03/10:27:29	1	544.300	52.0000
2016-09-03/11:50:42	3	5.30000	33.0000
2016-09-03/12:01:40	4	90.9067	5.00000
2016-09-03/12:26:59	5	62.0198	87.0000
2016-09-03/18:35:33	2	28.3000	68.0000
2016-09-03/18:54:45	3	40.1000	48.0000
2016-09-03/19:10:45	4	52.1000	44.0000
2016-09-03/19:23:33	5	56.9000	51.0000
2016-09-03/19:45:57	6	80.6000	67.0000
2016-09-04/00:09:01	1	98.1317	18.0000
2016-09-04/01:16:01	2	6.25368	12.0000
2016-09-04/01:32:18	3	6.25368	2.00000
2016-09-04/02:02:18	4	7.86639	2.00000
2016-09-04/02:22:00	5	5.79326	3.00000
2016-09-04/02:44:59	6	9.89498	8.00000
2016-09-04/09:15:24	4	36.8000	62.0000
2016-09-04/09:25:00	5	62.1000	54.0000
2016-09-04/09:37:48	6	87.9000	50.0000
2016-09-04/14:08:38	1	36.3110	37.0000
2016-09-04/15:46:23	3	9.50000	133.000
2016-09-04/16:05:36	4	17.9000	53.0000
2016-09-04/16:24:48	5	30.9000	43.0000
2016-09-04/16:40:48	6	1201.70	94.0000
2016-09-05/05:23:20	2	13.7000	76.0000
2016-09-05/05:42:32	3	17.9000	137.000
2016-09-05/06:08:09	4	23.8000	103.000
2016-09-05/06:24:09	5	52.1000	67.0000
2016-09-05/06:46:33	6	181.700	61.0000
2016-09-05/12:16:44	2	2867.70	45.0000
2016-09-05/13:07:56	4	272.300	37.0000
2016-09-05/13:27:08	5	714.300	34.0000
2016-09-05/13:46:20	6	2629.70	94.0000

2016-09-05/19:16:31	2	9.50000	63.0000
2016-09-05/19:42:07	3	15.8000	51.0000
2016-09-05/20:04:32	4	17.9000	60.0000
2016-09-05/20:26:56	5	26.0000	74.0000
2016-09-05/20:46:08	6	80.6000	33.0000
2016-09-06/02:42:59	3	5.30000	33.0000
2016-09-06/03:21:23	5	11.6000	57.0000
2016-09-06/03:40:35	6	9701.60	65.0000
2016-09-06/08:18:30	1	15005.6	61.0000
2016-09-06/10:00:54	4	9.50000	163.000
2016-09-06/10:26:31	5	20.0000	40.0000
2016-09-07/00:29:23	5	28.8668	107.000
2016-09-07/00:42:19	6	39.1969	237.000
2016-09-07/14:41:10	6	1.00000	51.0000
2016-09-07/20:28:27	2	17.9000	161.000
2016-09-07/21:45:15	6	714.300	131.000
2016-09-08/02:10:41	1	28.8668	204.000
2016-09-08/03:22:58	2	10.6814	14.0000
2016-09-08/03:33:34	3	2629.70	41.0000
2016-09-08/04:08:47	4	4431.60	25.0000
2016-09-08/04:18:23	5	3717.60	48.0000
2016-09-08/04:40:47	6	6845.60	74.0000
2016-09-08/09:29:00	1	452.973	0.00000
2016-09-08/10:24:16	2	57.4536	27.0000
2016-09-08/10:33:39	3	45.6749	4.00000
2016-09-08/11:17:54	5	1099.70	55.0000
2016-09-08/11:37:06	6	2629.70	242.000
2016-09-08/16:14:38	1	72.2698	964.000
2016-09-08/18:04:54	4	2629.70	24.0000
2016-09-08/18:20:54	5	4057.60	115.000
2016-09-08/18:33:42	6	10585.6	37.0000
2016-09-09/07:16:28	2	9.50000	166.000
2016-09-09/07:32:28	3	13.7000	49.0000
2016-09-09/08:01:17	4	7.40000	44.0000
2016-09-09/08:23:41	5	11.6000	43.0000
2016-09-09/08:42:53	6	28.3000	48.0000
2016-09-09/14:39:37	3	3.20000	37.0000
2016-09-09/14:55:37	4	7.40000	35.0000
2016-09-09/15:24:25	5	11.6000	75.0000
2016-09-10/11:03:28	2	3.20000	60.0000
2016-09-10/11:54:41	4	3.20000	38.0000
2016-09-10/12:17:05	5	3.20000	59.0000
2016-09-10/12:42:41	6	9.50000	77.0000
2016-09-11/00:20:21	1	36.3110	339.000
2016-09-11/01:52:56	3	15.8000	305.000
2016-09-11/02:08:56	4	28.3000	396.000
2016-09-11/02:18:32	5	43.8000	95.0000
2016-09-11/02:40:56	6	215.700	46.0000
2016-09-11/09:09:53	4	5.30000	52.0000
2016-09-11/09:19:29	5	9.50000	82.0000
2016-09-11/21:00:41	1	1.17376	2.00000
2016-09-11/22:36:08	3	15.8000	70.0000
2016-09-11/22:55:20	4	21.8000	52.0000

2016-09-11/23:20:56	5	26.0000	37.0000
2016-09-11/23:33:44	6	43.8000	45.0000
2016-09-12/04:12:58	1	28.8668	129.000
2016-09-12/06:01:32	4	3.20000	33.0000
2016-09-12/06:17:32	5	5.30000	49.0000
2016-09-12/06:30:20	6	11.6000	44.0000
2016-09-12/13:08:43	4	9.50000	16952.0
2016-09-12/13:18:19	5	11.6000	9984.00
2016-09-12/18:15:19	1	2.69644	10.0000
2016-09-12/20:18:39	5	5.30000	50.0000
2016-09-12/20:34:39	6	9.50000	42.0000
2016-09-15/02:20:41	1	28.8668	218.000
2016-09-15/04:13:02	5	7.40000	58.0000
2016-09-15/04:35:26	6	15.8000	65.0000
2016-09-15/09:14:24	1	4839.60	55.0000
2016-09-15/10:53:37	4	5.30000	40.0000
2016-09-15/11:12:49	5	9.50000	67.0000
2016-09-15/11:32:02	6	20.0000	44.0000
2016-09-15/18:12:05	5	7.40000	140.000
2016-09-15/18:34:29	6	30.9000	73.0000
2016-09-16/00:17:44	2	9.50000	95.0000
2016-09-16/00:30:32	3	11.6000	64.0000
2016-09-16/01:12:09	5	13.7000	63.0000
2016-09-16/01:34:33	6	80.6000	70.0000
2016-09-16/07:55:29	4	7.40000	47.0000
2016-09-16/08:14:41	5	11.6000	50.0000
2016-09-16/08:30:41	6	15.8000	60.0000
2016-09-16/13:22:44	1	2210.30	60.0000
2016-09-16/20:16:21	1	7.28723	33.0000
2016-09-17/04:09:50	2	3.20000	64.0000
2016-09-17/04:35:27	3	5.30000	47.0000
2016-09-17/05:13:51	5	11.6000	84.0000
2016-09-17/05:29:51	6	465.000	211.000
2016-09-17/12:14:11	5	15.8000	50.0000
2016-09-17/17:22:58	1	21.2592	199.000
2016-09-17/19:10:30	5	80.6000	173.000
2016-09-17/19:29:42	6	249.700	55.0000
2016-09-18/01:50:35	4	11.6000	209.000
2016-09-18/02:09:47	5	43.8000	72.0000
2016-09-18/02:28:59	6	125.000	57.0000
2016-09-21/06:18:51	2	7.40000	170.000
2016-09-21/06:38:03	3	3.20000	50.0000
2016-09-21/06:57:15	4	5.30000	39.0000
2016-09-21/07:13:15	5	5.30000	106.000
2016-09-21/07:26:03	6	11.6000	69.0000
2016-09-21/13:15:58	2	3.20000	59.0000
2016-09-21/13:35:10	3	5.30000	47.0000
2016-09-21/13:51:10	4	7.40000	161.000
2016-09-21/14:13:35	5	11.6000	120.000
2016-09-21/19:17:59	1	133.248	351.000
2016-09-21/20:28:18	3	5.30000	37.0000
2016-09-21/20:41:06	4	7.40000	29.0000
2016-09-21/21:09:54	5	20.0000	182.000

2016-09-21/21:29:06	6	351.700	46.0000
2016-09-22/02:16:20	1	19.6940	89.0000
2016-09-22/03:15:17	2	3411.70	49.0000
2016-09-22/03:28:05	3	2403.00	37.0000
2016-09-22/03:37:42	4	2017.70	36.0000
2016-09-22/04:09:42	5	2867.70	40.0000
2016-09-22/04:25:42	6	12602.9	57.0000
2016-09-22/16:15:38	1	5.36673	4.00000
2016-09-22/17:52:54	4	7.40000	34.0000
2016-09-23/00:20:42	2	5.30000	41.0000
2016-09-23/00:33:30	3	9.50000	50.0000
2016-09-23/00:46:18	4	13.7000	231.000
2016-09-23/01:05:30	5	21.8000	51.0000
2016-09-23/07:42:54	4	15.8000	359.000
2016-09-23/08:05:18	5	21.8000	233.000
2016-09-23/08:24:30	6	47.8000	53.0000
2016-09-24/04:16:31	2	5.30000	57.0000
2016-09-24/04:35:43	3	9.50000	70.0000
2016-09-24/04:51:44	4	20.0000	41.0000
2016-09-24/05:30:21	6	7.28723	40.0000
2016-09-24/10:09:06	1	499.000	151.000
2016-09-24/11:51:31	4	3.20000	34.0000
2016-09-24/12:07:31	5	7.40000	45.0000
2016-09-24/12:26:43	6	11.6000	61.0000
2016-09-25/00:16:01	1	18.2440	256.000
2016-09-25/01:15:40	2	56.9000	60.0000
2016-09-25/02:03:41	5	9.50000	35.0000
2016-09-25/02:22:53	6	52.1000	52.0000
2016-09-25/09:24:18	6	11.5303	33.0000
2016-09-25/16:05:51	5	95.9000	60.0000
2016-09-25/16:21:51	6	147.700	79.0000
2016-09-25/21:33:06	1	11548.9	59.0000
2016-09-25/22:14:42	2	11548.9	29.0000
2016-09-25/22:33:54	3	12602.9	45.0000
2016-09-25/23:02:43	5	15.8000	45.0000
2016-09-25/23:18:43	6	43.8000	51.0000
2016-09-26/04:26:29	1	15005.6	77.0000
2016-09-26/05:14:30	2	4057.60	30.0000
2016-09-26/06:24:54	6	15005.6	43.0000
2016-09-26/11:23:41	1	98.1317	14.0000
2016-09-26/13:21:30	6	499.000	48.0000
2016-09-29/09:16:38	1	123.438	40.0000
2016-09-29/11:22:01	6	8896.90	46.0000
2016-09-29/16:26:18	1	2.14364	4.00000
2016-09-29/17:05:41	2	3.39180	6.00000
2016-09-29/17:21:42	3	3.66137	0.00000
2016-09-29/17:45:41	4	3.95237	1.00000
2016-09-29/18:01:21	5	6.25368	5.00000
2016-09-29/18:17:18	6	10.6814	115.000
2016-09-29/23:23:39	1	66.9489	586.000
2016-09-30/00:30:08	3	17.9000	65.0000
2016-09-30/00:42:56	4	20.0000	41.0000
2016-09-30/01:02:08	5	40.1000	58.0000

2016-09-30/13:21:39	1	1321.47	2.00000
2016-09-30/21:06:46	2	33.7000	195.000
2016-09-30/22:20:22	6	73.9000	51.0000
2016-10-01/03:25:20	1	22.9488	152.000
2016-10-01/04:08:40	2	3.39180	4.00000
2016-10-01/04:23:40	3	3.95237	0.00000
2016-10-01/05:24:41	6	1.57870	0.00000
2016-10-01/12:03:27	5	40.1000	48.0000
2016-10-01/12:22:39	6	159.000	61.0000
2016-10-01/17:24:34	1	15005.6	53.0000
2016-10-01/18:06:10	2	918.300	47.0000
2016-10-01/18:22:10	3	1009.00	35.0000
2016-10-01/18:38:10	4	1099.70	35.0000
2016-10-01/19:03:47	5	1428.30	151.000
2016-10-01/19:16:35	6	2403.00	130.000
2016-10-02/01:05:42	2	3.20000	42.0000
2016-10-02/01:24:54	3	7.40000	37.0000
2016-10-02/01:44:06	4	9.50000	45.0000
2016-10-02/02:03:18	5	15.8000	74.0000
2016-10-03/04:24:38	1	15.6565	99.0000
2016-10-03/04:45:20	2	19.6940	45.0000
2016-10-03/11:58:00	2	11.6000	132.000
2016-10-03/12:26:49	3	21.8000	47.0000
2016-10-03/12:39:37	4	23.8000	30.0000
2016-10-03/13:05:13	5	36.8000	58.0000
2016-10-03/19:03:43	2	47.8000	118.000
2016-10-03/19:45:19	4	13.7000	363.000
2016-10-03/19:54:55	6	11.6000	68.0000
2016-10-03/20:17:19	7	52.1000	79.0000
2016-10-05/12:18:00	1	1.98581	9.00000
2016-10-05/19:17:26	1	1428.30	90.0000
2016-10-05/21:19:03	6	714.300	61.0000
2016-10-06/02:23:39	1	286.282	37.0000
2016-10-06/03:00:01	2	8.49158	21.0000
2016-10-06/03:11:40	3	6.25368	18.0000
2016-10-06/03:44:41	4	9.89498	9.00000
2016-10-06/03:54:20	5	13.4359	124.000
2016-10-06/04:14:58	6	33.6376	306.000
2016-10-06/09:21:40	1	7.28723	20.0000
2016-10-06/10:05:40	2	1.83961	4.00000
2016-10-06/10:21:41	3	1.98581	1.00000
2016-10-06/10:52:57	5	419.700	133.000
2016-10-06/11:15:21	6	2629.70	233.000
2016-10-06/17:14:04	2	28.3000	52.0000
2016-10-06/17:23:40	3	21.8000	97.0000
2016-10-06/18:18:05	6	3717.60	31.0000
2016-10-06/23:13:58	1	1.17376	7.00000
2016-10-07/00:01:03	2	15005.6	44.0000
2016-10-07/00:17:04	3	15005.6	50.0000
2016-10-07/01:17:52	6	2867.70	148.000
2016-10-07/08:17:09	6	15005.6	64.0000
2016-10-07/15:20:38	6	2.31401	32.0000
2016-10-07/21:16:12	2	9.50000	30.0000

2016-10-07/21:25:48	3	13.7000	411.000
2016-10-08/03:23:19	1	309.034	14.0000
2016-10-08/04:04:39	2	123.438	15.0000
2016-10-08/10:17:18	1	143.838	616.000
2016-10-08/12:20:37	6	2.49792	2.00000
2016-10-08/17:30:40	1	31.1610	822.000
2016-10-08/18:07:39	2	21.2592	138.000
2016-10-09/00:28:01	1	28.8668	234.000
2016-10-09/01:06:40	2	1.70417	2.00000
2016-10-09/01:40:42	4	13.7000	919.000
2016-10-09/01:53:30	5	15.8000	62.0000
2016-10-09/02:03:06	6	113.700	59.0000
2016-10-09/14:17:59	1	9.16646	28.0000
2016-10-09/15:23:43	3	17.9000	192.000
2016-10-09/15:36:31	4	21.8000	92.0000
2016-10-09/15:52:31	5	28.3000	645.000
2016-10-09/16:14:55	6	147.700	68.0000
2016-10-09/21:12:40	1	4.26649	29.0000
2016-10-10/04:16:38	1	8.49158	62.0000
2016-10-10/05:55:34	5	329.000	129.000
2016-10-10/18:16:38	1	39.1969	87.0000
2016-10-11/01:22:21	1	90.9067	91.0000
2016-10-11/01:58:20	2	4.60557	32.0000
2016-10-11/02:11:19	3	4.97160	2.00000
2016-10-11/08:25:57	1	419.623	0.00000
2016-10-11/09:44:30	4	113.700	30.0000
2016-10-11/09:54:06	5	136.300	80.0000
2016-10-11/10:06:54	6	215.700	59.0000
2016-10-11/15:16:59	1	36.3110	80.0000
2016-10-11/16:53:49	5	249.700	227.000
2016-10-11/22:20:18	1	3.66137	9.00000
2016-10-12/00:09:21	6	419.700	130.000
2016-10-12/05:20:56	1	569.786	0.00000
2016-10-12/06:33:56	4	9.50000	753.000
2016-10-12/07:10:23	6	1.17376	4.00000
2016-10-12/12:25:40	1	1.57870	4.00000
2016-10-12/19:24:18	1	13.4359	377.000
2016-10-12/21:08:45	6	1303.70	184.000
2016-10-13/02:19:59	1	78.0135	8.00000
2016-10-13/03:52:17	4	7.40000	44.0000
2016-10-13/04:08:17	5	26.0000	38.0000
2016-10-13/09:16:03	1	385.700	129.000
2016-10-13/10:52:04	5	21.8000	188.000
2016-10-13/11:11:16	6	52.1000	44.0000
2016-10-13/16:15:55	1	646.300	212.000
2016-10-13/18:17:32	6	249.700	69.0000
2016-10-13/23:06:07	1	5757.60	56.0000
2016-10-14/00:13:20	3	26.0000	39.0000
2016-10-14/00:32:32	4	56.9000	38.0000
2016-10-14/00:51:44	5	87.9000	69.0000
2016-10-14/01:07:44	6	159.000	48.0000
2016-10-14/06:21:39	1	181.700	62.0000
2016-10-14/06:21:40	2	167.611	66.0000

2016-10-14/07:30:40	4	8.49158	1.00000
2016-10-14/07:46:40	5	11.5303	69.0000
2016-10-14/08:07:58	6	19.6940	102.000
2016-10-14/13:12:59	1	28.8668	380.000
2016-10-14/14:09:33	2	215.700	479.000
2016-10-14/14:25:33	3	465.000	40.0000
2016-10-14/20:14:01	1	9.16646	192.000
2016-10-16/07:20:20	1	7.86639	16.0000
2016-10-17/11:24:58	1	180.932	25.0000
2016-10-17/13:06:39	6	210.834	22.0000
2016-10-18/08:21:19	1	5.79326	8.00000
2016-10-18/15:24:41	1	15.6565	72.0000
2016-10-18/17:03:23	5	3411.70	53.0000
2016-10-19/19:22:18	1	13.4359	54.0000
2016-10-19/20:02:27	2	2210.30	77.0000
2016-10-19/21:06:27	6	295.000	71.0000
2016-10-20/02:20:40	1	4.60557	28.0000
2016-10-20/04:01:59	6	601.000	104.000
2016-10-20/16:15:58	1	2.31401	22.0000
2016-10-21/20:14:21	1	42.3121	242.000