**Nonlinear Fokker-Planck Dynamics for Continuous Cohen-Grossberg Systems**

Roseli S. Wedemann

Probability densities that maximize the S_q power-law entropies are observed in the behavior of diverse types of complex systems, including some related to neuroscience. One known effective description of processes leading to these maximum entropy distributions is provided by nonlinear Fokker-Planck equations. We explore a nonlinear Fokker-Planck equation associated with the continuous Cohen-Grossberg model of the dynamics of neural networks. We prove that the stationary densities of this evolution equation have the S_q maximum entropy form. These distributions are q-exponentials, with an argument proportional to the Liapunov function of the Cohen-Grossberg network. The present nonlinear Fokker-Planck equation obeys an H-theorem, in terms of a free energy-like quantity, that is a linear combination of the Liapunov function and of an S_q entropy. These findings may help to understand the role of S_q maximum entropy distributions in neuronal dynamics.