Macroscopic violation of the law of heat conduction

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As an extension of previous studies, related to thermostatistics of small systems, we propose a model describing an anharmonic chain in contact, in principle, with a general heat reservoir. We use a perturbative approach, which only takes into account the energy scales involved in the problem, to obtain the degrees of freedom related to the system and apply the averages in Fourier-Laplace space. Hence, we are able to compute important quantities when the system reaches the steady state, like the heat flux. To illustrate our method we choose two kinds of noise, Gaussian white noise and Poisson noise. We investigate properties of heat flux in systems only under the influence of the former noise and then only subject to the latter. Finally we analyze a chain in contact with of both kinds of reservoirs, aiming to check if previous results found by Kanazawa *et al* remain valid in a general chain and if it is possible to apply here the concept of temperatures of higher order.