Linear Response for Chaotic Maps of Small Regularity

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My research is devoted to a numerical study of a particular problem in Chaos theory. The theory of chaotic dynamical systems is an actively developing field of mathematics. One of its main applications is in Statistical physics of classical systems. It allows to derive properties of the measure on the configuration space that is used to define macroscopic thermodynamics quantities, starting directly from microscopic, very fast unpredicatble dynamics. More precisely, chaos theory studies how unperdictable (yet deterministic) dynamics averages out various quantities and creates a probability distribution on the set of system states. The problem that is studied in my work is about the dependence of this measure on the system configuration space, on a parameter of the system. If a one-dimensional discrete chaotic dynamical system has differentiable dependence of its limiting averaged behavoir (ergodic averages) on a parameter, it is said to have linear response. I check the presense of linear response for a particular system that has low smoothness, using numerical simulations. The data collected during the simulations includes numerical values of ergodic averages' Newton quotients for different values of a parameter and different degrees of non-smoothness. This data allows to make a conclusion, that the system has linear response, which was unknown before and can not be tacked by existing analytical methods. Therefore it implies that there are mechanisms of existence of linear response, that were not discovered yet.