

S. Galatolo, "*Quantitative statistical stability in random systems, computer aided proofs linear response*"

Dynamical systems perturbed by noise appear naturally as models of physical and social systems. The presence of noise and its regularizing effects allow a functional analytic approach to be very efficient for the study of the statistical properties of these systems. In several interesting cases this can be approached rigorously by computational methods. As a nontrivial example of this, we prove the existence of noise induced order in the model of chaotic chemical reactions where it was first discovered numerically by Matsumoto and Tsuda in 1983. We show that in this random dynamical system the increase of noise causes the Lyapunov exponent to decrease from positive to negative, stabilizing the system. The method is based on a certified approximation of the stationary measure in the L1 norm. Time permitting we will also talk about linear response of such systems when the deterministic part of the system is perturbed deterministically.