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„Control of escapes in chaotic scattering"

First part.

Recently a technique has been proposed to keep the trajectories of a dynamical system with transient chaos close to a chaotic saddle and far from coexisting attractors. This particular technique is the, so called, partial control technique [1]. It is possible to use it when a horseshoe-like map appears in the phase space. Often the existence of such a map is closely related with the existence of fractal basins [2]. We focus our talk in the application of the partial control technique to chaotic scattering problem which has a lot of application in different topics in physics. For this purpose, we take as prototype model the H´enon-Heiles system as an example of transient chaos [3]. With this technique we show how to keep the trajectories inside the scattering region, even in presence of a noise intensity stronger than the applied control [4]. In this situation, we also add the study of the effect of the noise to the basin structure in phase space.

Second part.

Noisy scattering dynamics in the randomly driven H´enon-Heiles oscillator is investigated in the range of energies where the particles can leave the potential walls. This paper intends to investigate, through the exit basins and the time of escape, the influence of a external excitation and the energy dissipation on the unpredictability of a system that show chaotic scattering. In fact, the simulations have been done to find out the values of dissipation and excitation for which the exit basins present Wada properties. Through these calculations we show that the presence of the Wada basins has a specific relation with damping, forcing and energy value. Thus, it comes to be easier to investigate the dynamics and to control the unpredictability of the system.

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