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Examples of diffusion orbits in a priori stable systems with 3 degrees of freedom

Abstract

Given an integrable and convex Hamiltonian $h_0(p)$, we show that there are many small perturbations $h_\epsilon(p,q)((p,q) \in \mathbb{R}^3 \times \mathbb{T}^3)$ such that the Hamiltonian flow determined by $h_0 + h_\epsilon$ exhibits diffusion orbits. In these perturbed systems, there is no longer a normally hyperbolic invariant cylinder near strong resonance.

From a technical point of view, the diffusion orbits cannot be constructed along a sequence of isolated c-minimal orbits. Besides, some techniques are invented specifically for autonomous systems.