Numerical Study of Invariant Sets of a Quasiperiodic Perturbation of a Symplectic Map

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Abstract

We study the behavior of invariant sets of a volume-preserving map that is a quasiperiodic perturbation of a symplectic map, using approximation by periodic orbits. We present numerical results for analyticity domains of invariant surfaces, behavior after breakdown, and a critical function describing breakdown of invariant surfaces as a function of their rotation vectors. We discuss implications of our results to the existence of a renormalization group operator describing breakdown of invariant surfaces.