
Reactive islands framework for systems with three degrees of freedom

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Abstract

Transport between regions of phase space in Hamiltonian systems is governed by invariant geometric structures that act as separatrices between volumes of qualitatively different kinds of dynamics. At a fixed energy in systems with two degrees of freedom, these structures are stable and unstable manifolds asymptotic to unstable periodic orbits. Reactive island theory introduced by Ozorio de Almeida et al., *Physica D* 46 (1990) has been successful at providing insight into the qualitative and quantitative aspects of the structure of these manifolds. Many works that used reactive island theory stated the need to advance reactive islands to higher dimensional systems. This talk will present our recent work bringing reactive island theory to three degrees of freedom and discuss the approaches needed to investigate stable and unstable manifolds of normally hyperbolic invariant manifolds. (Joint work with V. J. Garcia-Garrido (Alcalá) and S. Wiggins (Bristol).)

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