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Computation of invariant manifolds in quasiperiodically forced systems. Some numerical explorations

Alex Haro
Departament de Matematica Aplicada i Analisi
Universitat de Barcelona
Gran Via 585
08007 Barcelona
SPAIN
alex@maia.ub.es

Abstract

We explain the parameterization method to compute invariant manifolds (tori and their whiskers) in quasi-periodic systems, and present some algorithms of computation. We expose several results of implementing these algorithms in examples, in which the invariant tori are continued with respect to parameters.

We push the continuation procedure to identify mechanisms of loss of hyperbolicity properties of the tori.

We also continue elliptic tori in conservative systems, detecting bifurcations at resonance that may lead to the existence of hyperbolic tori with non-orientable invariant manifolds.

Joint work with Rafael de la Llave (*University of Texas at Austin*).