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Towards a global study of area preserving maps. Applications to unfoldings

C. Simó and A. Vieiro
Departament de Matemàtica Aplicada i Anàlisi
Universitat de Barcelona
Gran Via 585
08007 Barcelona
SPAIN
[C. Simó: carles@maia.ub.es]
[A. Vieiro: vieiro@maia.ub.es]

Abstract

We present a phenomenological study of Area Preserving Maps, with emphasis on simple models. Paradigmatic models like the standard map, the separatrix map and a new model, the biseparatrix map, are useful to undertand the dynamics.

These paradigms can be analysed in a reasonable way. They allow to explain the main features of the dynamics. As test example the conservative Hénon map will be used.

Main points of interest are the escape of points from a given region when they are not surrounded by invariant rotational curves and the measure of the set on non-escaping points. Different rates of escape have beenfound.

The existence of regions where the dynamics is close to a diffusion, separated by cantori which are difficult to cross, having noble numbers as rotation number, are illustrated.

Applications are also made to conservative unfoldings of the Hopf-saddle-node bifurcation.

The talk will be closed by several open questions.