# Numerical and Rigorous aspects of low Dimensional Dynamical Systems

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**Abstract**

During the past 40 years there has been considerable progress on the structure of low dimensional dynamical systems (maps and flows on spaces of dimension less than four). In particular, it has been observed that certain geometric and numerical objects (e.g. stable and unstable manifolds, homoclinic points, topological entropy, Lyapunov exponents) play a prominent role in describing the orbit structure. Much of this development has been of a qualitative nature, and has led to tools for the numerical investigation of many systems. The question of which numerical experiments can be rigorously justified has become of fundamental importance. We discuss some recent progress on this question in relation to the numerical computation of stable and unstable manifolds and its application to topological entropy.