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Section:

9. Ordinary Differential Equations and Dynamical Systems

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Invariant measures for Anosov maps with small holes

We study Anosov diffeomorphisms on surfaces with small holes. The points that are mapped into the holes disappear and never return. In a previous paper we proved the existence of a conditionally invariant measure μ_+. Here we show that the iterations of any initially smooth measure, after renormalization, converge to μ_+. We construct the related invariant measure on the repeller and prove that it is ergodic and K-mixing. We prove the escape rate formula, relating the escape rate to the positive Lyapunov exponent and the entropy. Open billiards and other open Hamiltonian systems have become very popular in physics under the name of chaotic scattering theory in the past ten years. Very few results of it, however, are proved mathematically. Joint work with N. Chernov and S. Troubetzkoy (University of Alabama in Birmingham.

Reference: N. Chernov, R. Markarian and S. Troubetzkoy, *Conditionally invariant measures for Anosov maps with small holes*, to appear in Ergod. Th. & Dynam. Sys.