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Title:

Ergodic measure far away from tangences

Abstract:

A diffeomorphism has homoclinic tangency if the diffeomorphism has a hyperbolic periodic point and the stable and unstable manifolds of the periodic points have a non-transverse intersection.
We say a diffeomorphism f is C^1 far from homoclinic tangency if there exists a C^1 neighborhood a f such that every diffeomorphism in this neighborhood has non tangency. In this talk we'll introduce several recent results about diffeomorphisms far from tangencies.
1. We show that for diffeomorphisms far away from tangencies, its ergodic measure has at most one vanishing Lyapunov exponent, and the Oseledets splitting coresponding to positive, zero and negative Lyapunov exponents is a dominated splitting; when the invariant ergodic measure is hyperbolic, Pesin's stable manifold theorem and some kind of shadowing lemma are true.
2. There exists a C^1 generic subset R of diffeomorphisms far from tangencies such that for every $f \in R$, suppose C is a chain recurrent class of f:
a) if there is a family of sources converge to C, then C is a homoclinic class containing index 1 periodic points and C is the Hausdor® limit of a family of sources.
b) if C is a Lyapunov stable chain recurrent class, then C is a homoclinic class, denote i_0 the minimal index for the periodic points in C, then either C has a partial hyperbolic splitting Es i0 © Eu i0+1
or C is Hausdorff limit of a family of index $i_0 - 1$ periodic points and C has dominated splitting Es i0¡1 © Ecs 1 © Ecu i0+1.
c) if C is an aperiodic class, then C has partial hyperbolic splitting E^s ©Ec 1 ©E^u where E^s,$E^u \neq \emptyset$ and *dim*(Ec1) = 1.
As a corollary of b), for any diffeomorphism $f \in R$, the stable manifolds of periodic points of f cover a dense subset of the ambient manifold, that gives a positive answer for a conjecture of Bonatti in the setting of di®eomorphisms far from tangencies.

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