Title: Pesin theory for C1-dynamics: a story of domination .

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Abstract:

Pliss argument proved that every ergodic measure of a C1 diffeomorphism whose Lyapunov exponents are all negative is a hyperbolic periodic sink. The proof consists in building the stable manifold of a point. For points having both positive an negative Lyapunov exponents, Pesin proved the existence of invariant manifolds assuming some additional regularity (C1+Holder). A specific counter example was provided by Pugh showing that, in that setting, the regularity conditions are not removable.

In a joint work with Crovisier and Abdenur, we proved that Pesin result can be extended to C1-diffeomorphisms on the set of points for which the stable unstable Osceledec splitting is dominated. In a more recent work with Crovisier and Shinohara, we build open set of diffeomorphisms in which the generic diffeomorphisms admit uniquely ergodic chain recurrence classes where the unique invariant measure is hyperbolic. However the stable and unstable manifolds of the points in the class are trivial (reduced to the point). This seems to be a very general situation, for dynamics with a lack of domination.