RUHR-UNIVERSITÄT BOCHUM

FAKULTÄT FÜR MATHEMATIK

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Oberseminar Dynamische Systeme

Mañe generic properties of non-convex Hamiltonian

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Abstract:

In this talk I will introduce a certain Mañe generic property of non-convex Hamiltonians. A property (g) is called Mañe generic for a given C2 Hamiltonian H : T ∗M → R, if there exists a residual subset of potentials R ⊂ C∞(M) such that for all u ∈ O, H + u satisfies (g). Mañe perturbations are closely related to conformal perturbations of Riemannian metrics.
If H be a convex Hamiltonian, for a given k ∈ R, there exists a residual subset O ∈ C∞(M) such that (H + u)−1(k), u ∈ O, is a regular energy level and all closed orbits in this energy level are non-degenerate. This result reminds the so-called bumpy metric theorem in the context of Riemannian geometry. The set of Cr (r ≥ 2) bumpy metrics Br(M) on a manifold M, i.e. metrics with no closed degenerate geodesic, is residual in Rr(M), where Rr(M) refers to the set of all the Cr Riemannian metrics on M. However, it is important to note that Mañe perturbations (or conformal perturbations of Riemannian metrics) are much more restrictive than perturbations of Hamiltonians or metrics with respect to Withney topologies. After a quick review of the convex case, we will replace the assumption of convexity with a geometric condition for Hamiltonians, a condition that is weaker than convexity.

Guests are very welcome!