SYMPLECTIC BLENDERS NEAR WHISKERED TORI AND PERSISTENCE OF SADDLE-CENTER HOMOCLINICS

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Venue: Room 102, SCMS

Abstract:

A blender is a hyperbolic basic set such that the projection of its stable/unstable set onto some central subspace has a non-empty interior and thus has a higher topological dimension than the set itself.

We show that, for any symplectic C^r-diffeomorphism (where r is sufficiently large and finite, or $r=\infty,\omega$) of a $2N$-dimensional $(N>1)$ symplectic manifold, symplectic blenders can be obtained by an arbitrarily small symplectic perturbation near any one-dimensional whiskered KAM-torus that has a homoclinic orbit. Using this result, we prove that non-transverse homoclinic intersections between invariant manifolds of a saddle-center periodic point (i.e., it has exactly one pair of complex multipliers on the unit circle) are persistent in the following sense: the original map is in the C^r closure of a C^1 open set in the space of symplectic C^r diffeomorphisms, where maps having such saddle-center homoclinic intersections are dense. These results also hold for Hamiltonian flows in the corresponding settings.