

The scattering map to a normally hyperbolic manifold

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Abstract

The scattering map is a tool to describe homoclinic intersections to a normally hyperbolic manifold. It is roughly patterned upon the S-matrix in quantum mechanics.

We will discuss its definition, its geometric properties and several perturbative calculations.

We will show that the scattering map unifies and improves several calculations in Melnikov theory.

We will present several applications to show instability of integrable Hamiltonian systems under small perturbations.