

Hamiltonian and reversible dynamics near a homoclinic orbit to a nonhyperbolic equilibria

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Abstract

We study some elements of the global behavior of Hamiltonian and reversible dynamical systems with a homoclinic orbit to a saddle-center singular point. Here we discuss the occurrence of homoclinic orbits to the center manifold and sets of periodic orbits accumulating at the homoclinic orbit to the saddle-center.

We obtained a classification of the (generic) linear part of the return map for a homoclinic orbits to a saddle-center in reversible systems. This has highlighted different types of global dynamics near homoclinic orbits to saddle-centers in reversible systems. For each of these types, this dynamics has been studied.

Comparison of our results for reversible systems with those obtained in the Hamiltonian category already led to a number of observations of differences, most notably the occurrence of non-symmetric heteroclinic cycles.

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