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The Structure of Invariant Manifolds after a Supercritical Hamiltonian Hopf Bifurcation

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Abstract : We study the structure of the invariant manifolds of complex unstable periodic orbits of a family of periodic orbits, in a 3D autonomous Hamiltonian system of galactic type, after a transition of this family from stability to complex instability (Hamiltonian Hopf bifurcation). We consider the case of a supercritical Hamiltonian Hopf bifurcation. The invariant manifolds of complex unstable periodic orbits have two kinds of structures. The first kind is represented by a disk confined structure on the 4D space of section. The second kind is represented by a complicated central tube structure that is associated with an extended network of tube structures, strips and flat structures of sheet type on the 4D space of section.

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