

Centers on center manifolds in \mathbb{R}^3
and the vanishing set of inverse Jacobi multipliers

Isaac A. García, University of Lleida
Lleida, Spain

We consider the center problem at Hopf points of analytic vector fields in \mathbb{R}^3 that has a classical solution in the Lyapunov Center Theorem which is given in terms of an analytic first integral. Here we give a new solution in terms of an analytic inverse Jacobi multiplier V . The existence of a smooth and non-flat inverse Jacobi multiplier around a Hopf point of saddle-focus type is also proved. When studying these problems, we must discuss the relation between inverse Jacobi multipliers and center manifolds \mathcal{W}^c , in particular to know under what conditions $\mathcal{W}^c \subset V^{-1}(0)$. To illustrate our results, we solve the center problem for the Lü system.