



Z_2 -equivariant linear type bi-center cubic polynomial Hamiltonian vector fields

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Abstract

We study the global dynamical behavior of Z_2 -equivariant cubic Hamiltonian vector fields with a linear type bi-center at $(\pm 1, 0)$. By using a series of symbolic computation tools, we obtain all possible phase portraits of these Z_2 -equivariant Hamiltonian systems.

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1. Introduction and statement of the main results

In the qualitative theory of planar vector fields the analysis when an equilibrium point p is either a center or a focus is one of the classical problems. We called it the center problem or the center-focus problem. Poincaré [27] and Dulac [13] defined that an equilibrium point p of a vector field in \mathbb{R}^2 is a *center* if it has a neighborhood U filled with periodic orbits with the unique exception of this equilibrium point. And a center p is *global* if $\mathbb{R}^2 \setminus \{p\}$ is filled with periodic orbits.

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