

Abstract

In the talk we will first recall some problems of planar polynomial differential systems, then give the least upper bound on the number of centers of all planar polynomial Hamiltonian systems. This least upper bound characterizes some relationship between the number of centers and the number of invariant straight lines of the system, Further, we will provide the configurations of centers of planar polynomial Hamiltonian system with two intersecting invariant straight lines if the number of centers is exactly the least upper bound. As an application of these results, we answer an open problem, and give an example to show the effect of the number of centers and invariant straight lines on global dynamics of polynomial non-Hamiltonian systems. This is a joint work with Hongjin He and Changjian Liu.