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Bifurcation of critical periods for planar Hamiltonian systems of degree $2n-1$. (English)

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Summary: The orders of weak centers are determined for a family of planar Hamiltonian systems of degree $2n-1$ where only odd degree nonlinearities are included and the lowest degree is $2m-1$. Moreover, local bifurcation of critical periods is studied and it is proved that at most $m-1$ local critical periods can be produced and the maximum number is achievable.

MSC:

37K50 Bifurcation problems for infinite-dimensional Hamiltonian and Lagrangian systems
34C23 Bifurcation theory for ordinary differential equations
34C25 Periodic solutions to ordinary differential equations

Keywords:

Hamiltonian system; weak center; isochronous center; polynomial; critical period