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On the number of critical periods for planar polynomial systems of arbitrary degree

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ABSTRACT

We construct a class of planar systems of arbitrary degree n having a reversible center at the origin and such that the number of critical periods on its period annulus grows quadratically with n. As far as we know, the previous results on this subject gave systems having linear growth.

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1. Introduction and main results

Given a smooth planar autonomous vector field having a continuum of periodic orbits we can parameterize them by a real number h, through a global transversal smooth section, and then introduce the *period function*, T(h), as the smooth positive function which assigns to each orbit its minimal period. The isolated zeros of the derivative of this function are called *critical periods*. It is not difficult to prove that for a given continuum of periodic orbits, the number of critical periods depends neither on the transversal section, nor on its parametrization. It is well known that this function plays an

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