Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISSN 1083-0464
Issue 2, December 1999, pp. 1–12.
Submitted: April 19, 1999. Published: December 31 1999.

SMALL AMPLITUDE CRITICAL PERIODS IN A CUBIC POLYNOMIAL SYSTEM

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Abstract. In this paper, we study the local bifurcations of critical periods in the neighbourhood of a non-degenerate centre of a parametrized family of plane cubic polynomial systems. We find that this family has no isochronous centres. We show that at most three local critical periods bifurcate from a centre at the origin. Moreover there exist perturbations which lead to the maximum number of critical periods. To get some of the results we reducing the question to that of transversal intersection of some algebraic surfaces, using computational algebra techniques such as the Theory of of Gröbner Bases.

1991 A.M.S. (MOS) Subject Classifications Codes. 34C15, 34C25, 58F14, 58F21, 58F30.

Key words and phrases. Centers, Period Function, Critical Periods, Isochrone, Bifurcation, Perturbation.

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