

Note

A note on:
“Relaxation oscillators with exact limit cycles”[☆]

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Abstract

In this note we give a family of planar polynomial differential systems with a prescribed hyperbolic limit cycle. This family constitutes a corrected and wider version of an example given in the work [M.A. Abdelkader, Relaxation oscillators with exact limit cycles, J. Math. Anal. Appl. 218 (1998) 308–312]. The result given in this note may be used to construct models of Liénard differential equations exhibiting a desired limit cycle.

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1. Introduction and statement of the main result

Our purpose in this work is to give a family of planar polynomial differential systems of the form:

$$\dot{x} = P(x, y), \quad \dot{y} = Q(x, y), \quad (1)$$

for which an explicit expression of a limit cycle, that is, an isolated periodic orbit, can be given. We assume that $P(x, y)$ and $Q(x, y)$ belong to the ring of real polynomials in two variables

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