

New lower bound for the Hilbert number in piecewise quadratic differential systems

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Received 24 July 2018; revised 17 September 2018

Available online 2 October 2018

Abstract

We study the number of limit cycles bifurcating from a piecewise quadratic system. All the differential systems considered are piecewise in two zones separated by a straight line. We prove the existence of 16 crossing limit cycles in this class of systems. If we denote by $H_p(n)$ the extension of the Hilbert number to degree n piecewise polynomial differential systems, then $H_p(2) \geq 16$. As far as we are concerned, this is the best lower bound for the quadratic class. Moreover, in the studied cases, all limit cycles appear nested bifurcating from a period annulus of a isochronous quadratic center.

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MSC: primary 37G15, 37C27; secondary 37G10, 34C07

Keywords: Non-smooth differential system; Limit cycles in piecewise quadratic differential systems; First and second order perturbations of isochronous quadratic systems; Hilbert number for piecewise quadratic differential systems

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