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Bifurcation of 2-periodic orbits from non-hyperbolic fixed points *

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Abstract

We introduce the concept of 2-cyclicity for families of one-dimensional maps with a non-hyperbolic fixed point by analogy to the cyclicity for families of planar vector fields with a weak focus. This new concept is useful in order to study the number of 2-periodic orbits that can bifurcate from the fixed point. As an application we study the 2-cyclicity of some natural families of polynomial maps.

Mathematics Subject Classification 2010: 37C05, 37C25, 37C75, 39A30. Keywords: non-hyperbolic fixed point, two periodic points, bifurcation, cyclicity.

1 Introduction

The cyclicity of a family of vector fields having a weak focus or a center is a well known concept in the theory of planar vector fields and the problems surrounding the second part of the Hilbert's 16th problem [11, 16]. A grosso mode the cyclicity expresses the maximum

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