

Generating limit cycles from a nilpotent critical point via normal forms [☆]

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Abstract

It is well known that the normal form theory can be applied to solve the center–focus problem for monodromic planar nilpotent singularities. In this paper we see how this theory can also be applied to generate limit cycles from this type of singularities.

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1. Introduction and main results

Consider an autonomous planar ordinary differential equation having a nilpotent critical point. In a suitable coordinate system this differential equation can be written as

$$\begin{cases} \dot{x} = -y + X_2(x, y), \\ \dot{y} = Y_2(x, y), \end{cases} \quad (1.1)$$

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