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Many periodic solutions for a second order cubic periodic differential equation

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Abstract
The aim of this work is to provide results that assure the existence of many isolated T-periodic solutions for T-periodic second-order differential equations of the form $x'' = a(t)x + b(t)x^2 + c(t)x^3$. We use bifurcation methods, including Malkin functions and results of Fonda, Sabatini and Zanolin. In addition, we give a general result that assures the existence of a T-periodic perturbation of a non-isochronous center with an arbitrary number of T-periodic solutions.

Keywords Second order differential equation · Cubic · Periodic · Bifurcation methods

Mathematics Subject Classification 34C25 · 34A34 · 34C23 · 34C29

1 Introduction

The aim of this work is to provide results that assure the existence of many T-periodic solutions for the class of T-periodic second-order differential equations

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