

INFINITELY MANY PERIODIC SOLUTIONS OF DUFFING EQUATIONS UNDER INTEGRAL CONDITION

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ABSTRACT. In this paper, we study the multiplicity of periodic solutions of a Duffing equation

$$x'' + g(x) = p(t).$$

By using the generalized Poincaré–Birkhoff fixed point theorem, we prove that this equation has infinitely many periodic solutions provided g satisfies a kind of integral condition and the related time map satisfies oscillating condition.

1. Introduction

We are concerned with the multiplicity of periodic solutions of the Duffing equation of the form

$$(1.1) \quad x'' + g(x) = p(t),$$

where $g: \mathbb{R} \rightarrow \mathbb{R}$ is locally Lipschitz continuous, $p: \mathbb{R} \rightarrow \mathbb{R}$ is continuous and periodic with the least period equal to 2π .

The existence and multiplicity of periodic solutions of equation (1.1) has been widely studied in literature because of its significant applications in theory and

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