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BIFURCATION ANALYSIS OF A TIME-DELAYED TOURISM MODEL*

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Abstract

A stability and bifurcation analysis is undertaken in a neighborhood of the positive equilibrium of a tourism model with time delay. Choosing the time-delay as bifurcation parameter, a Hopf bifurcation analysis is undertaken, using center manifold reduction and normal form theory. As a result, the critical values of the delay are found which are responsible for the occurrence of oscillatory behavior in the system. Numerical simulations are presented to substantiate the theoretical results.

MSC: 34H20; 37L10; 91B55; 91B76.

keywords: tourism dynamics; asymptotic stability; oscillatory behavior; bifurcation; time delay.

1 Introduction

Nowadays the tourism industry has been expanded at global scale well beyond any prediction made in the past and became a well established industry alongside the traditional ones. It is an activity done by a person or a group of persons involving movement of people, goods and services from one place

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