



# Isochronicity into a family of time-reversible cubic vector fields

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## Abstract

In this work, we study necessary and sufficient conditions for the existence of isochronous centers into a family of cubic time-reversible systems. This class of reversible systems is characterized by the existence of an inverse integrating factor which is a certain power of an invariant straight line. © 2001 Elsevier Science Inc. All rights reserved.

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## 1. Introduction

It is known that the problem of isochronicity appears only for *nondegenerate centers*; i.e., centers whose linear part has nonzero imaginary eigenvalues (see [13]). This is due to the fact that the period function goes to infinity near a degenerate center.

We consider here planar autonomous cubic polynomial differential systems with a nondegenerate center at the origin. In an appropriate coordinate system  $(x, y)$  and upon rescaling of the independent variable  $t$ , these systems take the form

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