



Generating families in the restricted three-body problem

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Hénon, Michel (1931-)

Springer-Verlag, 1997-2001

Llibres electrònics

Monografia

The classical restricted problem of three bodies is of fundamental importance for its applications to astronomy and space navigation, and also as a simple model of a non-integrable Hamiltonian dynamical system. A central role is played by periodic orbits, of which a large number have been computed numerically. In this book an attempt is made to explain and organize this material through a systematic study of generating families, which are the limits of families of periodic orbits when the mass ratio of the two main bodies becomes vanishingly small. The most critical part is the study of bifurcations, where several families come together and it is necessary to determine how individual branches are joined. Many different cases must be distinguished and studied separately. Detailed recipes are given. Their use is illustrated by determining a number of generating families, associated with natural families of the restricted problem, and comparing them with numerical computations in the Earth-Moon and Sun-Jupiter case

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Título: Generating families in the restricted three-body problem Recurs electrònic] Michel Hénon

Editorial: Berlin New York Springer-Verlag 1997-2001

Descripción física: 1 recurs electrònic (2 volumes) illustrations

Tipo Audiovisual: Three-body problem Celestial mechanics Artificial satellites Orbits Bifurcation theory Artificial satellites Orbits. fast Bifurcation theory. fast Celestial mechanics. fast Three-body problem. fast

Mención de serie: Lecture notes in physics. New series m, monographs 0940-7677 m52, m65

Bibliografía: Includes bibliographical references and indexes

Contenido: [I. No special title] -- II. Quantitative study of bifurcations

ISBN: 9783540696506 electronic bk.) 3540696504 electronic bk.) 3540638024 9783540638025 3540417338 9783540417330

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