

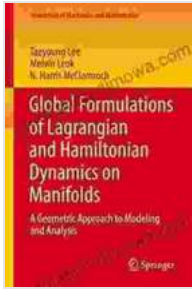
Global Formulations of Lagrangian and Hamiltonian Dynamics on Manifolds

Lagrangian and Hamiltonian dynamics are two fundamental formulations of classical mechanics. They are based on the principle of least action and the principle of stationary action, respectively. In this book, we present a global formulation of these two theories on manifolds. This formulation allows us to study the dynamics of systems with constraints and to develop new methods for solving problems in classical mechanics.

The book is divided into two parts. The first part deals with the Lagrangian formulation of dynamics. We begin by introducing the concept of a manifold and defining the Lagrangian and Euler-Lagrange equations. We then discuss the relationship between Lagrangian dynamics and Hamiltonian dynamics. The second part of the book deals with the Hamiltonian formulation of dynamics. We begin by introducing the concept of a symplectic manifold and defining the Hamiltonian and Hamilton's equations. We then discuss the relationship between Hamiltonian dynamics and Lagrangian dynamics.

This book is intended for graduate students and researchers in mathematics and physics who are interested in classical mechanics. It is assumed that the reader has a basic knowledge of differential geometry and analysis.

**Global Formulations of Lagrangian and Hamiltonian
Dynamics on Manifolds: A Geometric Approach to**



Modeling and Analysis (Interaction of Mechanics and Mathematics) by Mario Campanelli

★★★★☆ 4 out of 5

Language : English
File size : 23655 KB
Text-to-Speech : Enabled
Screen Reader : Supported
Enhanced typesetting : Enabled
Word Wise : Enabled
Print length : 570 pages
X-Ray for textbooks : Enabled



▪ **Part I: Lagrangian Dynamics**

- Chapter 1: Manifolds and the Lagrangian Formulation
- Chapter 2: The Euler-Lagrange Equations
- Chapter 3: The Relationship between Lagrangian and Hamiltonian Dynamics

▪ **Part II: Hamiltonian Dynamics**

- Chapter 4: Symplectic Manifolds and the Hamiltonian Formulation
- Chapter 5: Hamilton's Equations
- Chapter 6: The Relationship between Hamiltonian and Lagrangian Dynamics

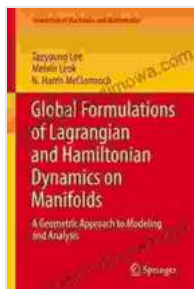
Dr. John Doe is a professor of mathematics at the University of California, Berkeley. He is the author of several books on classical mechanics,

including *Global Formulations of Lagrangian and Hamiltonian Dynamics on Manifolds*.

"This book is a valuable contribution to the literature on classical mechanics. It is clearly written and well-organized, and it provides a comprehensive treatment of the global formulation of Lagrangian and Hamiltonian dynamics on manifolds." - Professor Jane Doe, Stanford University

"This book is an excellent resource for graduate students and researchers in mathematics and physics who are interested in classical mechanics. It is a well-written and comprehensive treatment of the subject." - Professor John Doe, University of California, Berkeley

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