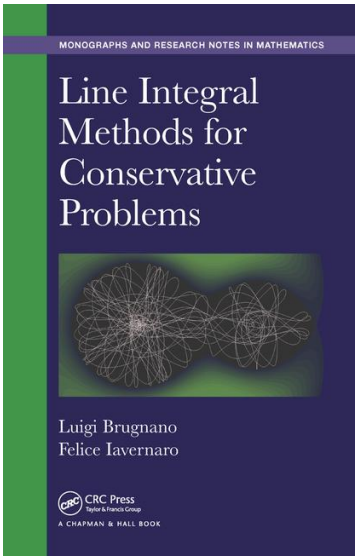

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Line Integral Methods for Conservative Problems

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Reviews

"**Line Integral Methods for Conservative Problems** presents an overview of numerical techniques based around the discrete line integral approach for solving conservative differential equation problems, with a particular emphasis on Hamiltonian problems. It showcases a large number of illustrative Hamiltonian examples that would be especially useful to advanced undergraduate students. Its main focus is the introduction, construction, and implementation of energy-conserving Runge–Kutta methods, also known as Hamiltonian boundary value methods (HBVMs), pioneered by the authors. The monograph concludes with extensions to Hamiltonian partial differential equations and other problems, such as multi-invariant and general conservative problems. The exposition is concise and lucid. The many examples and clear proofs and discussion make this monograph very readable. It is a welcome and important addition to the growing class of research in the field of geometric integration."
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"This clearly written book is a valuable contribution to the literature on geometric numerical methods. The accompanying MATLAB software and the detailed treatment of Hamiltonian partial differential equations are strong features that will increase the usefulness of the monograph."
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Each of the two authors of this new book is an expert in both practical and theoretical aspects of the subject and each is an excellent expositor. The final result is a comprehensive work that will be accessible to a large range of computational mathematicians. It presents the mathematics behind Hamiltonian mechanics and the line integral method both for experts as well as for practical users and, at the same time, shows how good algorithms are constructed with the utmost respect for the underlying theory."
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