

# Enhanced HBVMs for the numerical solution of Hamiltonian problems with multiple invariants

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## Abstract

Recently, the class of energy-conserving Runge-Kutta methods named Hamiltonian Boundary Value Methods (HBVMs), has been proposed for the efficient solution of Hamiltonian problems, as well as for other types of conservative problems. In this paper, we report further advances concerning such methods, resulting in their *enhanced* version (Enhanced HBVMs, or EHBVMs). The basic theoretical results are sketched, along with a few numerical tests on a Hamiltonian problem, taken from the literature, possessing multiple invariants.

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**Keywords:** Hamiltonian problems, Energy-conserving methods, Multiple invariants, Hamiltonian Boundary Value Methods, Enhanced Hamiltonian Boundary Value Methods.

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