

Numerical comparisons among some methods for Hamiltonian problems*

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Abstract. We report some numerical tests comparing the following methods for Hamiltonian problems: the symplectic Gauss-Legendre methods, the energy-preserving HBVM(k, s) methods (see, e.g., [1] and [2]), and the newly defined energy and quadratic invariants-preserving methods described in [3]. Both tests with constant and variable stepsize are discussed.

- [1] L. BRUGNANO, F. IAVERNARO, D. TRIGIANTE, *Analisis of Hamiltonian Boundary Value Methods (HBVMs): a class of energy-preserving Runge-Kutta methods for the numerical solution of polynomial Hamiltonian systems*, (2009), submitted ([arXiv:0909.5659](#)).
- [2] L. BRUGNANO, F. IAVERNARO, D. TRIGIANTE, *The Hamiltonian BVMs (HBVMs) Homepage*, ([arXiv:1002.2757](#)).
- [3] L. Brugnano, F. Iavernaro, D. Trigiante. On the existence of energy-preserving symplectic integrators based upon Gauss collocation formulae. (2010) *submitted* ([arXiv:1005.1930](#)).

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