Hamiltonian BVMs (HBVMs): implementation details and applications

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Abstract

Hamiltonian Boundary Value Methods are one step schemes of high order where the internal stages are partly exploited to impose the order conditions (*fundamental stages*) and partly to confer the formula the property of conserving the Hamiltonian function when this is a polynomial with degree at most ν, where ν is a given positive integer. The term "*silent stages*" has been coined for these latter set of extra-stages to mean that their presence does not cause an increase of the dimension of the associated nonlinear system to be solved at each step. By considering a specific method in this class and a number of numerical tests, we give some details about how the solution of the nonlinear system may be conveniently carried out and how to compensate the effect of roundoff errors.

References

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