Conservative Boundary Value Methods for the solution of polynomial Hamiltonian systems

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Abstract

We devise high order one-step methods suitable for the precise conservation of Hamiltonian functions of polynomial type. In deriving this class of methods, the key idea is to exploit the relation between the method itself and what we called *discrete line integral*, the discrete counterpart of the the line integral in conservative vector fields. This approach naturally suggests a formulation of such methods in terms of block Boundary Value Methods.