A Continuous Boundary Value Method of Order 8 for Solving the General Second Order Multipoint Boundary Value Problems

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Abstract : This paper deals with the numerical integration of the general second order multipoint boundary value problems. This has been achieved by the development of a continuous linear multistep method (LMM). The continuous LMM is used to construct a main discrete method to be used with some initial and final methods (also obtained from the continuous LMM) so that they form a discrete analogue of the continuous second order boundary value problems. These methods are used as boundary value methods and adapted to cope with the integration of the general second order multipoint boundary value problems. The convergence, the use and the region of absolute stability of the methods are discussed. Several numerical examples are implemented to elucidate our solution process.