LOCAL ADAPTIVE DIFFERENTIAL QUADRATURE METHOD FOR HIGH-ORDER DIFFERENTIAL EQUATIONS

Y. Wang[a], Y. B. Zhao[a], and G. W. Wei[a,b]

[a]Department of Computational Science,
National University of Singapore, Singapore 117543

[b]Department of Mathematics
Michigan State University, East Lansing, MI 48824
wei@math.msu.edu

High-order differential equation arises in many fields and requires the numerical solution [1]. Numerical solution of high-order differential equations with multi-boundary conditions is discussed in this work. Motivated by the discrete singular convolution (DSC) algorithm [2], the use of fictitious points as additional unknowns is proposed in the implementation of locally supported Lagrange polynomias. The proposed method can be regarded as a local adaptive differential quadrature method (La-DQM), which is similar to the recent differential quadrature methods [3,4] in many aspects. Two examples, an eigenvalue problem and a boundary-value problem, which are governed by a sixth-order differential equation and an eighth-order differential equation respectively, are employed to illustrate the proposed method. Results are compared with those in the literature [5,6]

Keywords: High-order di®erential equation; multi-boundary conditions; local adaptive differential quadrature method.

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