A Class of Accelerated Convergence Algorithms for Solving Ordinary Differential Systems

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ABSTRACT

In this paper a new technique for acceleration of convergence of discredited waveform method is proposed for solving ordinary linear differential systems. This technique is based on splitting the matrix A of the system in such a way that the resulting iteration matrix has an ideally small spectral radius. Two iterative algorithms are constructed based on the LU and QR decomposition of the system matrix, respectively. Numerical results are reported to compare the convergence properties of this new method with those of the Gauss-Jacobi and the Gauss-Seidel method.

Keywords: ordinary differential equations, waveform relaxation, convergence, decomposition, splitting