Implementation of MPI environment for solving large systems of ODEs using block method.

ABSTRACT

Parallel 2-point and 3-point block method will simultaneously compute the numerical solutions at two and three points respectively are suitable for solving large system of first order ordinary differential equations (ODEs) using variable step size. The Gauss Seidel iteration will be implemented for the block methods. The parallelism across the system is considered for the parallelization of the proposed methods using the Message Passing Interface (MPI) communication environment which runs on High Performance Computing (HPC). Numerical examples are given to illustrate the efficiency of the parallel implementation of the proposed method using 2, 4 and 6 processors with respect to the sequential one.

Keyword: Parallel; Block method.