
A Parallel Asynchronous Hybrid Method to Accelerate Convergence of a Linear System

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ABSTRACT

We present a parallel hybrid asynchronous method to solve large sparse linear systems by the use of a large parallel machine. This method combines a parallel GMRES(m) algorithm with the Least Squares method that needs some eigenvalues obtained from a parallel Arnoldi's algorithm. All of the algorithms run on the different processors of an IBM SP3 computer simultaneously. This implementation of this hybrid method allows to take advantage of the parallelism available and to accelerate the convergence by decreasing considerably the number of iterations.

Keywords: linear algebra, sparse matrices, iterative method, GMRES, hybrid method, Arnoldi, Least Squares, parallelism.