ALGORITHMS FOR SOLVING LARGE SPARSE SYSTEMS OF SIMULTANEOUS LINEAR EQUATIONS ON VECTOR PROCESSORS

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ABSTRACT

Very efficient algorithms for solving large sparse systems of simultaneous linear equations have been developed for serial processing computers. These involve a reordering of matrix rows and columns in order to obtain a near triangular pattern of non-zero elements. Then an LU factorization is developed to represent the matrix inverse in terms of a sequence of elementary gaussian eliminations, or pivots.

In this paper we show how to adapt these algorithms for efficient implementation on vector processors. Results obtained on the CYBER 200 Model 205 are presented for a series of large test problems which show the comparative advantages of the triangularization and vector processing algorithms.