ACCURATE AND EFFICIENT LDU DECOMPOSITIONS OF DIAGONALLY DOMINANT M-MATRICES

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Key words. LDU decomposition, rank revealing decomposition, accuracy, M-matrices, diagonal dominance.

AMS subject classifications. 65F05, 65F35, 65F15, 15A18

Abstract. An efficient method for the computation to high relative accuracy of the LDU decomposition of an \( n \times n \) row diagonally dominant \( M \)-matrix is presented, assuming that the off-diagonal entries and row sums are given. This method costs an additional \( \mathcal{O}(n^2) \) elementary operations over the cost of Gaussian elimination, and leads to a lower triangular, column diagonally dominant matrix and an upper triangular, row diagonally dominant matrix. Comparisons with other methods in the literature are commented and illustrated.

*Received by the editors on December 22, 2011. Accepted for publication on August 1, 2012. Handling Editor: Carlos Fonseca.

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