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A PARALLEL ALGORITHM FOR COMPUTING THE GROUP INVERSE VIA PERRON COMPLEMENTATION*

MICHAEL NEUMANN† AND JIANHONG XU‡

Abstract. A parallel algorithm is presented for computing the group inverse of a singular M–matrix of the form $A = I - T$, where $T \in \mathbb{R}^{n\times n}$ is irreducible and stochastic. The algorithm is constructed in the spirit of Meyer's Perron complementation approach to computing the Perron vector of an irreducible nonnegative matrix. The asymptotic number of multiplication operations that is necessary to implement the algorithm is analyzed, which shows that the algorithm saves a significant amount of computation over the direct computation of the group inverse of A.

Key words. Group inverses, M–matrices, Perron complements, Parallel algorithm.

AMS subject classifications. 15A09, 15A48, 15A51, 65F30, 65C40.

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†Department of Mathematics, University of Connecticut, Storrs, Connecticut 06269–3009, USA (neumann@math.uconn.edu). The work of this author was supported in part by NSF Grant No. DMS0201333.

‡Department of Mathematics and Statistics, University of West Florida, Pensacola, Florida 32514, USA (jxu@uwf.edu).