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A NOTE ON NEWTON AND NEWTON–LIKE INEQUALITIES FOR M–MATRICES AND FOR DRAZIN INVERSES OF M–MATRICES*

MICHAEL NEUMANN† AND JIANHONG XU‡

Abstract. In a recent paper Holtz showed that M–matrices satisfy Newton's inequalities and so do the inverses of nonsingular M–matrices. Since nonsingular M–matrices and their inverses display various types of monotonic behavior, monotonicity properties adapted for Newton's inequalities are examined for nonsingular M–matrices and their inverses.

In the second part of the paper the problem of whether Drazin inverses of singular M–matrices satisfy Newton's inequalities is considered. In general the answer is no, but it is shown that they do satisfy a form of Newton–like inequalities.

In the final part of the paper the relationship between the satisfaction of Newton's inequality by a matrix and by its principal submatrices of order one less is examined, which leads to a condition for the failure of Newton's inequalities for the whole matrix.

Key words. M–matrices, Nonnegative matrices, Generalized inverses, Newton's inequalities.

AMS subject classifications. 15A09, 15A24, 15A42.

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†Department of Mathematics, University of Connecticut, Storrs, Connecticut 06269–3009, USA (neumann@math.uconn.edu).

‡Department of Mathematics, Southern Illinois University at Carbondale, Carbondale, Illinois 62901–4408, USA (jxu@math.siu.edu).