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SPECTRUM PRESERVING LOWER TRIANGULAR COMPLETIONS—THE NONNEGATIVE NILPOTENT CASE*

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Abstract. Nonnegative nilpotent lower triangular completions of a nonnegative nilpotent matrix are studied. It is shown that for every natural number between the index of the matrix and its order, there exists a completion that has this number as its index. A similar result is obtained for the rank. However, unlike the case of complex completions of complex matrices, it is proved that for every nonincreasing sequence of nonnegative integers whose sum is n, there exists an $n \times n$ nonnegative nilpotent matrix A such that for every nonnegative nilpotent lower triangular completion, B, of A, $B \neq A$, $ind(B) > ind(A)$.

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