



THE ENHANCED PRINCIPAL RANK CHARACTERISTIC SEQUENCE FOR HERMITIAN MATRICES*

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Abstract. The enhanced principal rank characteristic sequence (epr-sequence) of an $n \times n$ matrix is a sequence $\ell_1 \ell_2 \cdots \ell_n$, where each ℓ_k is A, S, or N according as all, some, or none of its principal minors of order k are nonzero. There has been substantial work on epr-sequences of symmetric matrices (especially real symmetric matrices) and real skew-symmetric matrices, and incidental remarks have been made about results extending (or not extending) to (complex) Hermitian matrices. A systematic study of epr-sequences of Hermitian matrices is undertaken; the differences with the case of symmetric matrices are quite striking. Various results are established regarding the attainability by Hermitian matrices of epr-sequences that contain two Ns with a gap in between. Hermitian adjacency matrices of mixed graphs that begin with NAN are characterized. All attainable epr-sequences of Hermitian matrices of orders 2, 3, 4, and 5, are listed with justifications.

Key words. Principal rank characteristic sequence, Enhanced principal rank characteristic sequence, Mixed graph, Hermitian adjacency matrix, Minor.

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