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SPECTRAL PROPERTIES OF SIGN SYMMETRIC MATRICES*

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Abstract. Spectral properties of sign symmetric matrices are studied. A criterion for sign symmetry of shifted basic circulant permutation matrices is proven, and is then used to answer the question which complex numbers can serve as eigenvalues of sign symmetric 3×3 matrices. The results are applied in the discussion of the eigenvalues of QM-matrices. In particular, it is shown that for every positive integer n there exists a QM-matrix A such that A^k is a sign symmetric P-matrix for all $k \leq n$, but not all the eigenvalues of A are positive real numbers.

Key words. Spectrum, Sign symmetric matrices, Circulant matrices, Basic circulant permutation matrices, P-matrices, PM-matrices, Q-matrices, QM-matrices.

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