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ON GENERAL MATRICES HAVING THE PERRON-FROBENIUS PROPERTY*

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Dedicated to Hans Schneider on the occasion of his 80^{th} birthday

Abstract. A matrix is said to have the Perron-Frobenius property if its spectral radius is an eigenvalue with a corresponding nonnegative eigenvector. Matrices having this and similar properties are studied in this paper as generalizations of nonnegative matrices. Sets consisting of such generalized nonnegative matrices are studied and certain topological aspects such as connectedness and closure are proved. Similarity transformations leaving such sets invariant are completely described, and it is shown that a nonnilpotent matrix eventually capturing the Perron-Frobenius property is in fact a matrix that already has it.

Key words. Perron-Frobenius property, Generalization of nonnegative matrices, Eventually nonnegative matrices, Eventually positive matrices.

AMS subject classifications. 15A48.

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