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PERTURBING NON-REAL EIGENVALUES OF NONNEGATIVE REAL MATRICES*

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Abstract. Let A be an (entrywise) nonnegative $n \times n$ matrix with spectrum σ and Perron eigenvalue ρ. Guo Wuwen [Linear Algebra and its Applications 266 (1997), pp. 261–267] has shown that if λ is another real eigenvalue of A, then, for all $t \geq 0$, replacing ρ, λ in σ by $\rho + t$, $\lambda - t$, respectively, while keeping all other entries of σ unchanged, again yields the spectrum of a nonnegative matrix. He poses the question of whether an analogous result holds in the case of non-real λ. In this paper, it is shown that this question has an affirmative answer.

Key words. Nonnegative matrix, Spectrum, Realizable list, Perturbation, Perron eigenvector.

AMS subject classifications. 15A48, 15A18.

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