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HARMONIC RITZ AND LEHMANN BOUNDS*

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Abstract. This article reviews a variety of results related to optimal bounds for matrix eigenvalues — some results presented here are well-known; others are less known; and a few are new. The focus rests especially on Ritz and harmonic Ritz values, and right- and left-definite variants of Lehmann's optimal bounds. Two new computationally advantageous reformulations of left-definite Lehmann bounds are introduced, together with a discussion indicating why they might be preferable to the cheaper right-definite bounds.

Key words. optimal eigenvalue bounds, Lehmann intervals, harmonic Ritz values.

AMS subject classifications. 65F15, 49R05.

Dedicated to the memory of Friedrich Goerisch.

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