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A SIMPLE PROOF OF THE CLASSIFICATION OF NORMAL TOEPLITZ MATRICES*

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Abstract. An easy proof to show that every complex normal Toeplitz matrix is classified as either of type I or of type II is given. Instead of difference equations on elements in the matrix used in past studies, polynomial equations with coefficients of elements are used. In a similar fashion, it is shown that a real normal Toeplitz matrix must be one of four types: symmetric, skew-symmetric, circulant, or skew-circulant. Here trigonometric polynomials in the complex case and algebraic polynomials in the real case are used.

Key words. Normal matrices, Toeplitz matrices.

AMS subject classifications. 15A57, 47B15, 47B35

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