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ON THE FAST REDUCTION OF SYMMETRIC RATIONALLY GENERATED TOEPLITZ MATRICES TO TRIDIAGONAL FORM*

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Abstract. In this paper two fast algorithms that use orthogonal similarity transformations to convert a symmetric rationally generated Toeplitz matrix to tridiagonal form are developed, as a means of finding the eigenvalues of the matrix efficiently. The reduction algorithms achieve cost efficiency by exploiting the rank structure of the input Toeplitz matrix. The proposed algorithms differ in the choice of the generator set for the rank structure of the input Toeplitz matrix.

Key words. Toeplitz matrices, eigenvalue computation, rank structures

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