

Non-self-adjoint Toeplitz matrices with purely real spectrum and related problems

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We will present recent results on conditions guaranteeing reality of spectra of complex Toeplitz matrices. First, we will characterize the class of semi-infinite banded Toeplitz matrices whose all principal submatrices have real spectra by a condition imposed on the symbol of the matrix. We will also provide a description of the asymptotic eigenvalue distribution for such matrices. Second, we will focus on families of polynomials orthogonal with respect to the asymptotic eigenvalue distribution of the Toeplitz matrix and present some more detailed results for several concrete examples.