

APPROXIMATE INVERSION OF COMPLEX TRIANGULAR TOEPLITZ MATRICES

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Let

$$T_n = lT_n [t_0, t_1, \dots, t_{n-1}]$$

be a nonsingular lower triangular Toeplitz matrix with complex coefficients from the ring of $n \times n$ matrices over a field. The special structure of triangular Toeplitz matrices arise in a number of applications in scientific computing, signal and image processing. In this paper we consider the problem of a triangular Toeplitz matrix inversion. Explicitly, we propose an approximate algorithm of a $n \times n$ complex triangular Toeplitz matrix by using trigonometric polynomial interpolation [2, 4, 3] via two FFTs, one fast cosine transform (DCT) and one fast sine transform (DST) of $2n$ -vectors. Moreover, our method can be used to improve the complexity of the approximate block diagonalization algorithm for complex Hankel matrices introduced in [1].

References

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