

MODIFIED NEWTON'S ALGORITHM FOR COMPUTING THE GROUP INVERSES OF SINGULAR TOEPLITZ MATRICES

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摘要

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MODIFIED NEWTON'S ALGORITHM FOR COMPUTING THE GROUP INVERSES OF SINGULAR TOEPLITZ MATRICES

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Abstract Newton's iteration is modified for the computation of the group inverses of singular Toeplitz matrices. At each iteration, the iteration matrix is approximated by a matrix with a low displacement rank. Because of the displacement structure of the iteration matrix, the matrix-vector multiplication involved in Newton's iteration can be done efficiently. We show that the convergence of the modified Newton iteration is still very fast. Numerical results are presented to demonstrate the fast convergence of the proposed method.

Key words [Newton's iteration](#) [Group inverse](#) [Toeplitz matrix](#) [Displacement rank](#).

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