

# A SHIFT-SPLITTING PRECONDITIONER FOR NON-HERMITIAN POSITIVE DEFINITE MATRICES

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摘要

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# A SHIFT-SPLITTING PRECONDITIONER FOR NON-HERMITIAN POSITIVE DEFINITE MATRICES

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**Abstract** A shift splitting concept is introduced and, correspondingly, a shift-splitting iteration scheme and a shift-splitting preconditioner are presented, for solving the large sparse system of linear equations of which the coefficient matrix is an ill-conditioned non-Hermitian positive definite matrix.

The convergence property of the shift-splitting iteration method and the eigenvalue distribution of the shift-splitting preconditioned matrix are discussed in depth, and the best possible choice of the shift is investigated in detail. Numerical computations show that the shift-splitting preconditioner can induce accurate, robust and effective preconditioned Krylov subspace iteration methods for solving the large sparse non-Hermitian positive definite systems of linear equations.

**Key words** [Non-Hermitian positive definite matrix](#) [Matrix splitting](#) [Preconditioning](#) [Krylov subspace method](#) [Convergence](#).

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