

ON PRECONDITIONING SCHUR COMPLEMENT AND SCHUR COMPLEMENT PRECONDITIONING *

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Abstract. We study two implementation strategies to utilize Schur complement technique in multilevel recursive incomplete LU preconditioning techniques (RILUM) for solving general sparse matrices. The first strategy constructs a RILUM to precondition the original matrix. The second strategy solves the first Schur complement matrix using the lower level parts of the RILUM as the preconditioner. We discuss computational and memory costs of both strategies and the potential effect on grid independent convergence rate of RILUM with different implementation strategies.

Key words. sparse matrices, Schur complement, RILUM, preconditioning techniques.

AMS subject classifications. 65F10, 65N06.

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