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Zhu Xinyun* (zhu_x@utpb.edu), Department of Mathematics, University of Texas of the Permian Basin, Odessa, TX 79762, and **Hongtao Fan** and **Bing Zheng**. *A relaxed positive semi-definite and skew-Hermitian splitting preconditioner for non-Hermitian generalized saddle point problems*. Preliminary report.

For non-Hermitian saddle point linear systems, Pan, Ng and Bai presented a positive semi-definite and skew-Hermitian splitting (PSS) preconditioner (Pan et al. Appl. Math. Comput. 172, 762–771 2006), to accelerate the convergence rate of the Krylov subspace iteration methods like the GMRES method. In this paper, a relaxed positive semi-definite and skew-Hermitian (RPSS) splitting preconditioner based on the PSS preconditioner for the non-Hermitian generalized saddle point problems is considered. The distribution of eigenvalues and the form of the eigenvectors of the preconditioned matrix are analyzed. Moreover, an upper bound on the degree of the minimal polynomial is also studied. Finally, numerical experiments of a model Navier-Stokes equation are presented to illustrate the efficiency of the RPSS preconditioner compared to the PSS preconditioner, the block diagonal preconditioner (BD), and the block triangular preconditioner (BT) in terms of the number of iteration and computational time. (Received August 19, 2016)