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# SIMPLER BLOCK GMRES FOR NONSYMMETRIC SYSTEMS WITH MULTIPLE RIGHT-HAND SIDES*

HUALEI LIU† AND BAOJIANG ZHONG†

**Abstract.** A Simpler Block GMRES algorithm is presented, which is a block version of Walker and Zhou's Simpler GMRES. Similar to Block GMRES, the new algorithm also minimizes the residual norm in a block Krylov space at every step. Theoretical analysis shows that the matrix-valued polynomials constructed by the new algorithm is the same as the original one. However, Simpler Block GMRES avoids the factorization of a block upper Hessenberg matrix. In consequence, it is much simpler to program and requires less work. Numerical experiments are conducted to illustrate the performance of the new block algorithm.

**Key words.** linear systems, iterative methods, block methods, GMRES, Simpler GMRES

**AMS subject classifications.** 65F10

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†Department of Mathematics, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, China ({liuhl,zhbj}@nuaa.edu.cn).