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

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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

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