OBLIQUE PROJECTION METHODS FOR LINEAR SYSTEMS WITH MULTIPLE RIGHT-HAND SIDES[*]

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Abstract. In the present paper, we describe new Lanczos-based methods for solving nonsymmetric linear systems of equations with multiple right-hand sides. These methods are based on global oblique projections of the initial residual onto a matrix Krylov subspace. We first derive the global Lanczos process to construct biorthonormal bases and we give some of its properties. Then we introduce new methods such as the global BCG and the global BiCGSTAB algorithms. Look-ahead versions of these algorithms are also given. Finally numerical examples will be given.

Key words. Global Lanczos, matrix Krylov subspace, block methods, iterative methods, nonsymmetric linear systems, multiple right-hand sides

AMS subject classifications. 65F10, 65F25

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