Electronic Transactions on Numerical Analysis.
Volume 12, pp. 216-233, 2001.

ISSN 1068-9613.

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RETOOLING THE METHOD OF BLOCK CONJUGATE GRADIENTS*

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Abstract. Block implementations of the conjugate-gradients method for the solution of a linear system must deal with linear dependences that may appear in the descent or residual blocks in the course of the iteration. New algorithms presented here avoid rank estimation and deflation through the use of changes of bases and algorithmic reformulations that eliminate rank near defects. The transformations include a robust process of nonunitary orthogonalisation in the metric of a symmetric positive-definite matrix.

Key words. Linear equations, conjugate gradients, orthogonalisation.

AMS subject classifications. 65F10, 65F25.

* Received December 1, 2000. Accepted for publication July 23, 2001. Recommended by L. Reichel.
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