Electronic Transactions on Numerical Analysis.
Volume 29, pp. 97-115, 2008.
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ISSN 1068-9613.

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A RANK-ONE UPDATING APPROACH FOR SOLVING SYSTEMS OF LINEAR EQUATIONS IN THE LEAST SQUARES SENSE*

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Abstract. The solution of the linear system $Ax = b$ with an $m \times n$-matrix A of maximal rank $\mu := \min(m, n)$ is considered. The method generates a sequence of $n \times m$-matrices H_k and vectors x_k so that the AH_k are positive semidefinite, the H_k approximate the pseudoinverse of A and x_k approximate the least squares solution of $Ax = b$. The method is of the type of Broyden's rank-one updates and yields the pseudoinverse in μ steps.

Key words. linear least squares problems, iterative methods, variable metric updates, pseudo-inverse

AMS subject classifications. 65F10, 65F20

*Received October 9, 2006. Accepted for publication September 3, 2007. Published online May 19, 2008. Recommended by M. Hochbruck.

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