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Arthur Neuman* (aneuman@kent.edu), **Lothar Reichel** and **Hassane Sadok**. *Range Restricted Iterative Methods for Linear Discrete Ill-posed Problems.*

This paper is concerned with iterative solution methods for large linear systems of equations with a matrix of ill-determined rank and an error-contaminated right-hand side. The numerical solution is delicate, because the matrix is very ill-conditioned and may be singular. It is natural to require that the computed iterates live in the range of the matrix when the latter is symmetric, because then the iterates are orthogonal to the null space. Computational experience indicates that it can be beneficial to require that the iterates live in the range of the matrix also when the latter is nonsymmetric. We discuss the design and implementation of iterative methods that determine iterates with this property, and focus on the situation when the error in the right-hand side is small. (Received January 26, 2010)