

LOW-RANK ITERATIVE METHODS FOR PROJECTED GENERALIZED LYAPUNOV EQUATIONS*

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Abstract. We generalize an alternating direction implicit method and the Smith method for large-scale projected generalized Lyapunov equations. Such equations arise in model reduction of descriptor systems. Low-rank versions of these methods are also presented, which can be used to compute low-rank approximations to the solution of projected generalized Lyapunov equations with low-rank symmetric, positive semidefinite right-hand side. Numerical examples are presented.

Key words. projected generalized Lyapunov equations, alternating direction implicit method, Smith method, low-rank approximation

AMS subject classifications. 65F10, 65F30, 15A22, 15A24,

*Received March 10, 2006. Accepted for publication March 21, 2008. Published online on August 4, 2008. Recommended by P. Van Dooren. This work was supported by the DFG Research Center MATHEON "Mathematics for key technologies" in Berlin.

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