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

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