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AN EXTENDED BLOCK ARNOLDI ALGORITHM FOR LARGE-SCALE SOLUTIONS OF THE CONTINUOUS-TIME ALGEBRAIC RICCATI EQUATION*

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Abstract. We present a new iterative method for the computation of approximate solutions to large-scale continuous-time algebraic Riccati equations. The proposed method is a projection method onto an extended block Krylov subspace, which can be seen as a sum of two block Krylov subspaces in A and A^{-1}. We give some theoretical results and present numerical experiments for large and sparse problems. These numerical tests show the efficiency of the proposed scheme as compared to the block Arnoldi and Newton-ADI methods.

Key words. Block Arnoldi; Extended block Krylov; Low rank; Riccati equations.

AMS subject classifications. 65F10, 65F30

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