An ADI-Block Arnoldi method for large scale Lyapunov and Algebraic Riccati equations

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In this talk, we present a new ADI-Krylov method for solving large and sparse Lyapunov and Algebraic Riccati equations. Such problems appear in control theory and other fields. The proposed method is a block Krylov method based on the block Arnoldi algorithm and preconditioned with the ADI method. We then use the above scheme in the Newton iteration to obtain low rank approximate solutions to Algebraic Riccati equations. Numerical results are given to show the efficiency and accuracy of the new algorithm.