

On the matrix equation $X - A^*X^{-1}A = I$.

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Abstract

The fixed-point iteration is a simple method for finding the maximal Hermitian positive definite solution of the matrix equation $X - A^*X^{-1}A = I$. Choosing a good initial matrix of the iteration can speed up its convergence. Recently, Ivanov, Hasanov and Uhlig proposed a strategy for choosing better initial matrices, which improve the convergence. From numerical experiments we can observe that dramatic improvement happens for some matrices A , namely for normal matrices. In this talk we reveal the underlying reason for the dramatic improvement in convergence for normal (and thus nearly normal) matrices. We also present exact extremal solutions of the minus equation when A is a normal matrix.

This talk is based on a joint work with C.-H. Guo