Sherman-Morrison-Woodbury formula for Sylvester and T-Sylvester equation

(Talk)

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(joint work with Ninoslav Truhar)

We will present the Sherman-Morrison-Woodbury-type formula for the solution of the Sylvester equation of the form

$$(A_0 + U_1V_1)X + X(B_0 + U_2V_2) = E,$$

as well as for the solution of the T-Sylvester equation of the form

$$(A_0 + U_1V_1)X + X^T(B_0 + U_2V_2) = E,$$

where U_1, U_2, V_1, V_2 are low-rank matrices. These formulas can be used for the construction of the efficient algorithms for calculating the solutions of Sylvester and T-Sylvester equations, and for their optimization. Application of new algorithms will be illustrated in several examples.

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