SOLVING THE SYLVESTER EQUATION $AX - XB = C$ WHEN $\sigma(A) \cap \sigma(B) \neq \emptyset$ *

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Abstract. The method for solving the Sylvester equation $AX - XB = C$ in the complex matrix case, when $\sigma(A) \cap \sigma(B) \neq \emptyset$, by using Jordan normal form, is given. Also, the approach via the Schur decomposition is presented.

Key words. Sylvester equation, Jordan normal form, Schur decomposition.

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