

CONTROLLABILITY AND NONSINGULAR SOLUTIONS OF SYLVESTER EQUATIONS*

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Abstract. The singularity problem of the solutions of some particular Sylvester equations is studied. As a consequence of this study, a good choice of a Sylvester equation which is associated to a linear continuous time system can be made such that its solution is nonsingular. This solution is then used to solve an eigenstructure assignment problem for this system. From a practical point view, this study can also be applied to automatic control when the system is subject to input constraints.

Key words. Stabilizability, Controllability indices, Sylvester equation, Nilpotent matrices, Eigenstructure assignment.

AMS subject classifications. 15A06, 15A24.

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