

BOUNDARY VALUE PROBLEMS ASSOCIATED WITH PERTURBED NONLINEAR SYLVESTER SYSTEMS – EXISTENCE AND UNIQUENESS

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Abstract. This paper is concerned with the existence and uniqueness of solutions to the boundary value problem associated with the general first-order linear/nonlinear Sylvester system

$$R'(t) = A(t)R(t) + R(t)B(t) + F(t, R(t)),$$

where the matrices involved are of appropriate dimensions and are continuous on some interval $[0, T]$, and $F \in C[[0, T] \times R^{n \times n}, R^{n \times n}]$. The boundary conditions considered are of the form

$$UR = \alpha,$$

where $U : C[0, T] \mapsto R^{n \times n}$, and $C[0, T]$ is the space of all continuous bounded functions $f : [0, T] \mapsto R^{n \times n}$.

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