



STRUCTURED EIGENVALUE/EIGENVECTOR BACKWARD ERRORS OF MATRIX PENCILS ARISING IN OPTIMAL CONTROL*

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Abstract. Eigenvalue and eigenpair backward errors are computed for matrix pencils arising in optimal control. In particular, formulas for backward errors are developed that are obtained under block-structure-preserving and symmetry-structure-preserving perturbations. It is shown that these eigenvalue and eigenpair backward errors are sometimes significantly larger than the corresponding backward errors that are obtained under perturbations that ignore the special structure of the pencil.

Key words. Eigenvalue backward error, Eigenvector backward error, Structured matrix pencil, Dissipative Hamiltonian system, H_∞ control, Linear quadratic optimal control.

AMS subject classifications. 93D20, 93D09, 65F15, 15A21, 15A22.

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