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PERTURBATION ANALYSIS FOR EIGENSTRUCTURE ASSIGNMENT OF LINEAR MULTI-INPUT SYSTEMS*

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Abstract. The state-feedback pole (or eigenvalue) assignment problem is a fundamental problem in control system design. The term *eigenstructure* denotes the specification of eigenvalues *and* eigenvectors (or certain properties of the latter). Normally, the eigenvectors are calculated as an intermediate solution. In assignment for multi-input systems, the solution (the feedback matrix) is not unique. However, the solution is unique if the eigenvectors are set. Perturbation bounds are given for multi-input eigenstructure assignment of eigenvalues and eigenvectors occurring in complex-conjugate pairs. Numerical results which support the analysis are also provided.

Key words. controllable system, state feedback, eigenstructure assignment, multi-input pole assignment, perturbation analysis.

AMS subject classifications. 15A18, 65F15, 65F35, 93B55.

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