EIGENVALUE PLACEMENT IN COMPLETIONS OF DAES*

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Abstract. Differential algebraic equations (DAEs) are used to describe many physical processes. A completion of a DAE is an ordinary differential equation whose solutions include those of the DAE. Algorithms exist for designing stabilized completions of differential algebraic equations. Recent work on observers for DAEs has shown the need for more information on, and control of the placement of, the additional eigenvalues of the completion. This paper investigates this eigenvalue placement problem. Results are given relating the additional eigenvalues of the completion and the choice of stabilization matrix for certain important classes of linear DAEs.

Key words. Differential algebraic equations, Stability, Eigenvalue placement, Completions.

AMS subject classifications. 15A18, 34A09, 65L80.

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