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# Partial Disturbance Decoupling Problem for Structured Transfer Matrix Systems by Measurement Feedback.

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*Abstract*: Partial disturbance decoupling problems are equivalent to zeroing the first, say $k$ Markov parameters of the closed-loop system between the disturbance and controlled output. One might consider this problem when it is not possible to zero all the Markov parameters which is known as exact disturbance decoupling. Structured transfer matrix systems are linear systems given by transfer matrices of which the infinite zero order of each nonzero entry is known, while the associated infinite gains are unknown and assumed mutually independent. The aim in this paper is to derive the necessary and sufficient conditions for the generic solvability of the partial disturbance decoupling problem for structured transfer matrix systems, by dynamic output feedback. Generic solvability here means solvability for almost all possible values for the infinite gains of the nonzero transfer matrix entries. The conditions will be stated by generic essential orders which are defined in terms of minimal weight of the matchings in a bipartite graph associated with the structured transfer matrix systems.

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