Rank-One LMI Approach to Robust Stability of Polynomial Matrices.

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Abstract: Necessary and sufficient conditions are formulated for checking robust stability of an uncertain polynomial matrix. Various stability regions and uncertainty models are handled in a unified way. The conditions, stemming from a general optimization methodology similar to the one used in μ-analysis, are expressed as a rank-one LMI, a non-convex problem frequently arising in robust control. Convex relaxations of the problem yield tractable sufficient LMI conditions for robust stability of uncertain polynomial matrices.