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ON THE PERTURBATION OF SINGULAR ANALYTIC MATRIX FUNCTIONS: A GENERALIZATION OF LANGER AND NAJMAN'S RESULTS

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Abstract. Given a singular $n \times n$ matrix function $A(\lambda)$, analytic in a neighborhood of an eigenvalue $\lambda_0 \in \mathbb{C}$, and perturbations, $B(\lambda, \varepsilon)$, such that $B(\lambda, 0) \equiv 0$ and analytic in λ and ε near $(\lambda_0, 0)$, we provide sufficient conditions on these perturbations for the existence of eigenvalue expansions of the perturbed matrix $A(\lambda) + B(\lambda, \varepsilon)$ near λ_0. We also describe the first order term of these expansions. This extends to the singular case some results by Langer and Najman.

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