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Invariant subspace perturbations of Hamiltonian matrices with defective imaginary eigenvalues

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We show how invariant subspaces will change when a defective matrix is perturbed. We focus on the case when an invariant subspace corresponding to the same size Jordan blocks of a single eigenvalue is perturbed. The perturbations are characterized in terms of fractional orders. As an application, we study a class of Hamiltonian matrices that are related to Riccati inequalities. We show how the purely imaginary eigenvalues and their invariant subspaces are perturbed under certain structured perturbations.

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