

The distance to singularity for dissipative Hamiltonian systems

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For general linear differential-algebraic systems it is an open problem to determine the distance to the nearest singular system and only bounds are known as well as computational methods to determine such bounds. If the system is, however, a dissipative Hamiltonian system, then an explicit formula for the distance can be given in terms of a common nullspace of three matrices. These results can also be extended to dissipative port-Hamiltonian control systems to characterize the distances to uncontrollability and unobservability at infinity.

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