Parametric Order Reduction of Proportionally Damped Second-Order Systems

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In this paper, the structure-preserving order reduction of proportionally damped and undamped second-order systems is presented. The discussion is based on the second -order Krylov subspace method, and it is shown that for systems with proportional damping, the damping matrix does not contribute to the projection matrices, and that the reduction can be carried out using the classical Krylov subspaces. As a result of direct projection, the reduced-order model is parameterized in terms of the damping coefficients.

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