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Optimization of material with modal damping

*Applied mathematics and computation*, 218 (2012), 13; 7326-7338

**Abstract.** This paper considers optimal parameters for modal damping

\[ D = M_1 (M^{-1} K; \alpha_1, \ldots, \alpha_k) + K_2 (K^{-1} M; \alpha_1, \ldots, \alpha_k) \]

in mechanical systems described by the equation \( M \ddot{x} + D \dot{x} + Kx = 0 \), where matrices \( M \) and \( K \) are mass and stiffness matrices, respectively. Different models of proportional and generalized proportional damping are considered and optimal parameters with respect to different optimization criteria related to the solution of the corresponding Lyapunov equation are given. Also, some specific example problems are compared with respect to the optimal and estimated parameters.