Damping of Torsional Beam Vibrations by Control of Warping Displacement

Supplemental damping of torsional beam vibrations is considered by viscous bimoments acting on the axial warping displacement at the beam supports. The concept is illustrated by solving the governing eigenvalue problem for various support configurations with the applied bimoments represented as viscous boundary conditions. It is demonstrated that properly calibrated viscous bimoments introduce a significant level of supplemental damping to the targeted vibration mode and that the attainable damping can be accurately estimated from the two undamped problems associated with vanishing and infinite viscous parameters, respectively.

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