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# Vibration mitigation of coupled bending-torsion beams via tuned mass dampers

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*Abstract*: Tuned mass dampers are well established devices for vibration mitigation of structures. These devices are tuned in order to move the main resonance frequencies of a structure away from troubling frequencies of external excitations. Several studies in literature can be found regarding the dynamics of structures coupled with tuned mass dampers. Attention is focused on those works involving beams as primary structures. All of them have always considered beams with symmetric cross section, and no works have dealt with beams with asymmetric one. The latter beams, of great interest since employed in several engineering applications, show coupled bending torsional phenomena due to the asymmetry of the cross section. In this study, an exact and computationally efficient technique is proposed to address the dynamics of beams with mono symmetric cross section coupled with tuned mass dampers. The proposed technique is based on the elementary coupled bending torsion theory and makes use of the theory of generalised function to handle the actions exchanged between the beam and the tuned mass dampers. The proposed technique allows to investigate the effectiveness and vibration reduction capabilities of tuned mass dampers for the beams under study.

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