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MS4: Non-Classical Problems in Structural Dynamics of Continuous Media

Dynamics of a harmonically excited sandwich structure with adaptive damping layer

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Abstract: Vibrations of two parallel elastic slender beams connected by smart viscoelastic damping blocks is investigated. Rheological properties of these elements can be adapted according to the working conditions of the system. A range of harmonic excitations that can represent real dynamic loads of such mechanical and civil engineering structures as aircraft wing spars, bridge spans or trusses is studied. A dynamic model of the system that incorporates geometrical non-linearity resulting from the shear deformations of the damping blocks is proposed. For a given dynamic load, the positions of the damping blocks that ensure the best damping capabilities are identified, and then it is studied whether activation or deactivation of selected blocks can ensure satisfactory vibrations suppression when dynamic load changes.