Efficient attenuation of beam vibrations by inertial amplification - DTU Orbit (17/03/2019)

Efficient attenuation of beam vibrations by inertial amplification

We demonstrate efficient attenuation of flexural vibrations by attaching a simple inertial amplification (IA) mechanism to a slender elastic beam. The mechanism generates enhanced inertial forces between two attachment points, which effectively counteracts the elastic forces in the beam for certain anti-resonance frequencies. These anti-resonances may be generated in the low-frequency range, even for a small added mass. Furthermore, the hybrid structures are shown to exhibit two neighbouring anti-resonance dips providing wide and deep attenuation regions in the frequency domain. The obtained numerical results are validated with the experimental data.

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