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Broadband vibration of a beam under tensile load

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Abstract: The vibration characterization is directly associated with its physical properties of the system, such as mass, damping, and stiffness. Vibration absorber has been used for vibration control purposes in many sectors of engineering for over a century. A limitation of the device is that it acts as a notch filter, only being effective over a narrow band of frequencies. Therefore, many researchers have design metamaterial targeting the improvement of vibration attenuation and inducing bandgaps. This paper is concerned with the vibration control of a beam under tensile load with periodically attached vibration absorbers. The study is performed by using an approach based on modal analysis. Numerical investigations are conducted regarding the effects of mass ratio, non-uniform spacing and number of resonators.

Keywords: beam vibration, absorber, modal analysis.

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