

Flexural waves propagation in piezoelectric metamaterial beam

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Abstract: In this paper, we analysed a piezoelectric metamaterial to focus on flexural waves in beams modelled by using the spectral element method. The piezoelectric metamaterial is applied in cases of attenuation and control of waves, as well as, adopted in the designing process of the piezo-lens used to trace the waves trajectories in large frequency bands. The configuration considered of a periodic array of piezoelectric patches incorporated to a beam undergoing transverse motion. The periodic arrangement of shunted patches provides the beam with attenuation properties which depend on the resonant behaviour of the shunts. A numerical model predicts the flexural wave behaviour of the beam for different shunting configurations.

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