Prediction of Vibration Transmission within Periodic Bar Structures: Analytical Vs Numerical Approach

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The present analysis focuses on vibration transmission within semi-infinite bar structure. The bar is consisting of two different materials in a periodic manner. A periodic bar model is generated using two various methods: The Finite Element method (FEM) and a Floquet theory approach. A parameter study is carried out regarding the influence of the number of periods at various frequencies within a semi-infinite bar, stop bands are illustrated at certain periodic intervals within the structure. The computations are carried out in frequency domain in the range below 500 Hz. Results from both of the above methods are compared and analyzed