

CFA '18 LE HAVRE ■ 23-27 avril 2018
14^{ème} Congrès Français d'Acoustique



Vibration mitigation using stick-slip Interactions in a composite core

G. Chevallier

FEMTO-ST, 24 rue de l'épitaphe, 25000 Besancon, France
gael.chevallier@femto-st.fr

Metamaterials are architected micro-structures that have recently shown convincing performances for vibration reduction. Two main phenomena are commonly coupled to achieve these performances, local resonances and Bragg scattering that allow to develop interesting frequency bandgaps where waves cannot propagate. The performances for vibration reduction of a lattice metamaterial introduced as a core in a composite structure are here experimentally and numerically studied. This structure is composed of a series of slits with rotational symmetries and is placed between two aluminium plates : the planar configuration with periodic resonant patterns is propitious to generate bandgaps. Different parameters are adjusted to achieve good performances as the number of patterns, the width of the slots, or the length of the internal beams. Nonlinear effects consisting in stick-slip interactions inside patterns are evaluated as favorable aspects to increase the obtained global damping.