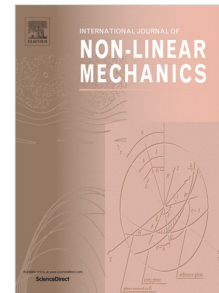


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# An impact based mass-in-mass unit as a building block of wideband nonlinear resonating metamaterial

A. Banerjee<sup>1,2</sup>, E.P.Calius<sup>3</sup>, R. Das<sup>4</sup>

<sup>1</sup>*Department of Mechanical Engineering, IIT Kanpur, 208016, India*

<sup>2</sup>*Department of Mechanical Engineering, University of Auckland, Auckland 1010, New Zealand*

<sup>3</sup>*Callaghan Innovation, Auckland 1052, New Zealand*

<sup>4</sup>*Department of Aerospace Engineering, RMIT University, Melbourne, 1052, Australia*

\*Corresponding author: [aban991@aucklanduni.ac.nz](mailto:aban991@aucklanduni.ac.nz), [abanerjee24@gmail.com](mailto:abanerjee24@gmail.com)

## Authors' information

Arnab Banerjee:

Research Associate, Department of Mechanical Engineering, Indian Institute of Technology, Kanpur  
PhD candidate, Department of Mechanical Engineering, The University of Auckland, 20 Symonds Street, 1010, Auckland, New Zealand  
email: [aban991@aucklanduni.ac.nz](mailto:aban991@aucklanduni.ac.nz), [abanerjee24@gmail.com](mailto:abanerjee24@gmail.com)

Emilio P. Calius

Senior Scientist, Future Material and Structures, Medical Device Technology Group, Callaghan Innovation, 24 Balfour Rd, Parnell, Auckland 1052, Auckland, New Zealand  
email: [emilio.calius@callaghaninnovation.govt.nz](mailto:emilio.calius@callaghaninnovation.govt.nz)

Raj Das

Associate Professor, School of Engineering, Sir Lawrence Wackett Aerospace Research Centre, RMIT University, Bundoora East campus, Melbourne, Victoria 3083, Australia  
email: [raj.das@rmit.edu.au](mailto:raj.das@rmit.edu.au)

## Abstract

Vibration transmission through a mass-in-mass unit is frequency dependent due to the difference in phase between the internal resonator and the surrounding structure. Generally, the attenuation band is confined between the two-transmission bands for a linear resonating metamaterial. In the case of a linear metamaterial, the attenuation band can be widened up to a certain limit by tuning the material properties, but cannot be extended infinitely by removing the 2<sup>nd</sup> transmission band. An impacting resonator can attenuate the vibration of the metamaterial due to the counteraction of the external excitation by the resulting impulse force

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