

m-044

Flexural wave propagation in 1-D hierarchical metamaterial Euler-Bernoulli beams Miranda Jr., E.J.P.(1); Nobrega, E.D.(2); Gomes, C.B.F.(3); (1); (2) UFMA; (3) IFMA;

The flexural wave propagation in a 1-D hierarchical metamaterial Euler-Bernoulli beam is investigated. This 1-D elastic metamaterial beam with graded arrays of spring-mass resonators is capable of filtering the propagation of flexural waves over a specified range of frequency, called Bragg-type and/or locally resonant band gaps. This metamaterial beam is composed by steel and its microstructure is not considered for the simulation, since the wave length is considerably high. The plane wave expansion (PWE) and the extended plane wave expansion (EPWE) are used to compute the complex dispersion diagram of the hierarchical metamaterial beam with attached resonators. The band gaps are opened up with different values of unit cell wave attenuation. The results can be used for elastic wave attenuation in low frequencies using 1-D hierarchical metamaterial beams.