Seminar April 1, 2019

On the analyses and applications of wave propagation in bifurcated lattice waveguides

Centre des Matériaux Pierre-Marie Fourt - Ecole Nationale Supérieure des Mines de Paris - ARMINES
CNRS UMR 7633, BP 87 91003 Evry, France

On the analyses and applications of wave propagation in bifurcated lattice waveguides

Basant Lal Sharma[a]

[a] Department of Mechanical Engineering, IIT Kanupr, India

In the presence of length scales, the elastic wave propagation problem, as well as those involving other kinds of dynamical phenomena (lattice waves or phonons, electronic transport, etc), involve an interplay between wave dispersion and structural features. The present talk concerns an exposure to the analysis of discrete scattering effects in certain simple lattice waveguides connected by a bifurcation induced junction. The talk will give a flavour of the mathematical formulation and simplified expressions for the physically relevant entities such as the reflectance and transmittance. The talk will also include some open problems associated with these newly emerging developments as well as some glimpses of the ongoing work. An application of the developed framework to electronic transport in nanotubes will be also briefly discussed.

References

Sharma BL, "Wave propagation in bifurcated waveguides of square lattice strips", SIAM Journal on Applied Mathematics, 76(4), 1355--1381, Apr 2016 DOI 10.1137/15M1051464

Sharma BL, "Electronic transport across a junction between armchair graphene nanotube and zigzag nanoribbon", The European physical journal B, Voliume 91(5):84, Mar 2018 DOI 10.1140/epjb/e2018-80647-2

Yield set of perfectly-palstic porous materials subjected to anti-plane shear

Centre des Matériaux Pierre-Marie Fourt - Ecole Nationale Supérieure des Mines de Paris - ARMINES
CNRS UMR 7633, BP 87 91003 Evry, France

François Willot[a]

[a] Mines ParisTech, France

We study the effective yield stress of rigid perfectly-plastic media subjected to anti-plane shear. Use is made of an identity between two mechanical and geometrical quantities: the effective yield stress and the length of certain minimal paths spanning the porous medium. Our main focus is on random media containing an infinitesimal porosity f. We show that in the dilute limit $f \ll 1$, the effective yield stress scales as $\sim f^{2/3}$, at lowest-order correction in f.

Vous pouvez nous contacter :

- Par courrier postal :

Centre des Matériaux Pierre-Marie Fourt
Mines ParisTech
CNRS UMR 7633, BP 87 91003 Evry, France

- Par téléphone : +33 (0)1 60 76 30 00
- Par fax : +33 (0)1 60 76 31 50
- Par courrier électronique : semteam@mat.mines-paristech.fr
- Site web : http://www.mat.mines-paristech.fr

Equipe séminaire :

Hugo LAUNAY
Cléa PLOUZE
Mélanie THEVENEAU