

Accepted Manuscript

Modeling and simulation of wave scattering of multiple inhomogeneities in composite media

Chen Wang, Xiaodong Wang



PII: S1359-8368(16)00012-3

DOI: [10.1016/j.compositesb.2016.01.010](https://doi.org/10.1016/j.compositesb.2016.01.010)

Reference: JCOMB 3966

To appear in: *Composites Part B*

Received Date: 7 July 2015

Revised Date: 7 December 2015

Accepted Date: 13 January 2016

Please cite this article as: Wang C, Wang X, Modeling and simulation of wave scattering of multiple inhomogeneities in composite media, *Composites Part B* (2016), doi: 10.1016/j.compositesb.2016.01.010.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Modeling and simulation of wave scattering of multiple inhomogeneities in composite media

Chen Wang, Xiaodong Wang*

*Department of Mechanical Engineering, University of Alberta
Edmonton, AB, Canada T6G 2G8*

Abstract

This article presents an analytical-numerical method for the multiple scattering problem of elastic composite media with interacting inhomogeneities under time-harmonic antiplane elastic incident waves. The main focus is on the detailed evaluation of the effectiveness and accuracy of the method in the determination of the local dynamic behaviour of such composite media with significant numbers of inhomogeneities. The method is based on the eigenfunction expansion (Fourier expansion) of single inhomogeneity problem and the use of a pseudo-incident wave technique, which allows the accurate determination of local stress field caused by the interaction. The accuracy and effectiveness of the method for dealing with multiple interaction problems are discussed in detail. Illustrative examples under different loading and geometric conditions are considered to study the local dynamic field, the effective properties of the composite media based on self-consistent material modelling, and the behaviour of stop-band of wave propagating for periodic inhomogeneity arrangements.

*Corresponding author. Email: xiaodong.wang@ualberta.ca

Download English Version:

<https://daneshyari.com/en/article/7212911>

Download Persian Version:

<https://daneshyari.com/article/7212911>

[Daneshyari.com](https://daneshyari.com)