An Efficient Method for Simulating Free Waves in Multiferroic Laminates

W. Q. Chen

Department of Engineering Mechanics, Zhejiang University, Hangzhou 310027, China

Email: chenwq@zju.edu.cn; Tel./Fax: 86-571-87951866

The reverberation-ray matrix method (MRRM) was originally developed for predicting dynamic responses of framed structures, and later extended to analyzing transient wave propagation in layered media. It was recognized only a few years ago that the method could provide a stable numerical scheme for calculating dispersion spectra for free wave propagation. In this paper, we report its application to waves in multiferroic laminates, and strengthen on two new achievements: (1) the generalized phase relation that is derived based on the theory of differential equations, along with the concept of coordinate transform, and (2) the proper formulation of MRRM in cylindrical coordinates when the layering of the laminate is along the radial direction. As numerical examples, wave propagations in laminated multiferroic plates and cylindrical shells are considered.