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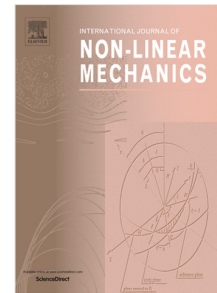
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Explicit transfer matrices of pre-stressed elastic layers

P. C. Vinh^a *; V.T.N. Anh^a, J. Merodio^b, L.T. Hue^c

^aFaculty of Mathematics, Mechanics and Informatics

Hanoi University of Science

334, Nguyen Trai Str., Thanh Xuan, Hanoi, Vietnam

^bDepartment of Continuum Mechanics and Structures

E.T.S. Ing. Caminos, Canales y Puertos

Universidad Politecnica de Madrid, 28040 Madrid, Spain

^cDepartment of Mathematics

Vietnam National University of Forestry

Xuan Mai-Chuong My, Hanoi, Vietnam

Abstract

We establish transfer matrices in explicit form of pre-stressed elastic layers for compressible and incompressible materials. Because these transfer matrices are totally explicit, they are a powerful tool for solving various problems related to the wave propagation in layered pre-stressed elastic media. To prove this point, we investigate the reflection of a qP wave from a pre-stressed compressible elastic layer overlying a pre-stressed compressible elastic half-space. By using the transfer matrix of a pre-stressed compressible elastic layer, we derive the formulas in closed form for the reflection coefficients. Based on the obtained formulas, we carry out some numerical examples to investigate the dependence of the reflection coefficients on the incident angle, the wave frequency, the prestresses and the ratio of mass densities.

Key words: Pre-stressed elastic layer, Transfer matrix, Reflection coefficient.

*Corresponding author: Tel:+84-4-35532164; Fax:+84-4-38588817; E-mail address: pcvinh@vnu.edu.vn (P.C. Vinh)

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