

Explicit secular equations of Stoneley waves in a non-homogeneous orthotropic elastic medium under the influence of gravity

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Abstract: The problem of Stoneley waves in a non-homogeneous orthotropic elastic medium under the influence of gravity was studied recently by Abd-Alla and Ahmed [A.M. Abd-Alla, S.M. Ahmed, Stoneley waves and Rayleigh waves in a non-homogeneous orthotropic elastic medium under the influence of gravity, Appl. Math. Comput. 135 (2003) 187-200], who derived the secular equation of the wave in the implicit form. In this paper, by using an appropriate representation of the solution, we obtain the secular equation of the wave in the explicit form. Moreover, considering its special cases, we derive explicit secular equations for a number of investigations of Stoneley waves under the influence of gravity, for which only the implicit dispersion equations were previously obtained. © 2009 Elsevier Inc. All rights reserved.

Author Keywords: Gravity; Non-homogeneous; Orthotropic; Secular equation; Stoneley wave velocity; Stoneley waves

Index Keywords: Dispersion equations; Elastic medium; Explicit form; Implicit form; Non-homogeneous; Secular equations; Stoneley waves; Acoustic wave velocity

Year: 2010

Source title: Applied Mathematics and Computation

Volume: 215

Issue: 10

Page : 3515-3525

Link: Scopus Link

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ISSN: 963003

CODEN: AMHCB

DOI: 10.1016/j.amc.2009.10.047

Language of Original Document: English

Abbreviated Source Title: Applied Mathematics and Computation

Document Type: Article

Source: Scopus

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