SH Wave Scattering Problems for Multiple Layered Anisotropic Inclusions

Jung-Ki Lee [1]

[1] Department of Mechanical and Design Engineering, Hongik University

2639, Sejong-ro, Jochiwon-eup, Sejong city, 339-701 Korea

inq3jkl@wow.hongik.ac.kr

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A Volume Integral Equation Method (VIEM) is applied for the effective analysis of elastic wave scattering problems in unbounded solids containing general anisotropic inclusions. It should be noted that this numerical method does not require use of the Green's function for anisotropic inclusions to solve this class of problems since only the Green's function for the unbounded isotropic matrix is necessary for the analysis. This new method can also be applied to general two-dimensional elastodynamic problems involving arbitrary shapes and numbers of anisotropic inclusions. A detailed analysis of SH wave scattering problems are developed for an unbounded isotropic matrix containing multiple layered orthotropic inclusions. Numerical results are presented for the displacement and stress fields at the interfaces of the inclusions in a broad frequency range of practical interest. Through the analysis of plane elastodynamic problems in an unbounded isotropic matrix with multiple layered orthotropic inclusions, it is established that this new method is very accurate and effective for solving plane elastic problems in unbounded solids containing general anisotropic inclusions of arbitrary shapes and numbers of layered anisotropic inclusions.