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Non-reflecting boundary conditions for elastic waves. (English) Zbl 0708.73012

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Summary: An exact non-reflecting boundary condition is devised for time-harmonic two-dimensional elastodynamics in infinite domains. The domain is made finite by the introduction of a circular artificial boundary on which this exact condition is imposed. In the finite computational domain a finite element method is employed. Numerical examples are presented in which the accuracy and efficiency of the method using the exact non-local boundary condition are compared with those of methods based on approximate local boundary conditions. The method is also used to solve problems in large finite domains by reducing them to smaller domains. In addition, local boundary conditions are derived which are exact for waves with a limited number of angular Fourier components.

MSC:

74J10 Bulk waves in solid mechanics

74S05 Finite element methods applied to problems in solid mechanics

74J15 Surface waves in solid mechanics

35J05 Laplace operator, Helmholtz equation (reduced wave equation), Poisson equation

Cited in **82** Documents

Keywords:

time-harmonic two-dimensional elastodynamics; infinite domains; circular artificial boundary; large finite domains; local boundary conditions; limited number of angular Fourier components

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