

PROCEEDINGS

Simulation of Wave Propagation Through Inhomogeneous Medium Waveguides Based on Green's Functions

Wenzhi Xu¹, Zhuojia Fu^{1,*} and Qiang Xi¹

¹Center for Numerical Simulation Software in Engineering and Sciences, College of Mechanics and Materials, Hohai University, Nanjing, 211100, China

*Corresponding Author: Zhuojia Fu. Email: zhuojiafu@gmail.com

ABSTRACT

Acoustic wave propagation through an inhomogeneous medium may lead to undergo substantial modification. This paper proposed a Green's functions-based method for the simulation of wave propagation through inhomogeneous medium waveguides. Under ideal conditions, a modified wave equation is derived by variable transformations, in which only the wave speed varies with spatial coordinates. Based on the modified wave equation the acoustic Green's functions are derived. Then, the localized method of fundamental solution (LMFS) in conjunction with the acoustic Green's functions is introduced to solve the modified wave equation. In the LMFS, the acoustic Green's function is considered as its basic function to construct the approximate solution at a certain node by using some of its adjacent nodes instead of the whole discretization nodes. Finally, the feasibility and accuracy are demonstrated by some numerical examples including acoustic propagation in marine environments.

KEYWORDS

Wave propagation; inhomogeneous medium; Green's functions; localized method of fundamental solution

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