World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:9, No:03, 2015

A Unified Ghost Solid Method for the Elastic Solid-Solid Interface

Authors : Abouzar Kaboudian, Boo Cheong Khoo

Abstract : The Ghost Solid Method (GSM) based algorithms have been extensively used for numerical calculation of wave propagation in the limit of abrupt changes in materials. In this work, we present a unified version of the GSMs that can be successfully applied to both abrupt as well as smooth changes of the material properties in a medium. The application of this method enables us to use the previously-matured numerical algorithms which were developed to be applied to homogeneous mediums, with only minor modifications. This method is developed for one-dimensional settings and its extension to multi-dimensions is briefly discussed. Various numerical experiments are presented to show the applicability of this unified GSM to wave propagation problems in sharply as well as smoothly varying mediums.

Keywords : elastic solid, functionally graded material, ghost solid method, solid-solid interaction
Conference Title : ICTCM 2015 : International Conference on Theoretical and Computational Mechanics
Conference Location : Istanbul, Türkiye
Conference Dates : March 23-24, 2015