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

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**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.

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