

Generalized Multiscale Finite Element Method for scattering problem in heterogeneous domain

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Abstract

In this work, we consider the time-harmonic scattering by a heterogeneous domain. We assume that the obstacles are hard regions. The mathematical model is described by Helmholtz problem. For a numerical solution, it is necessary to construct a small-scale computational grid, the elements of which can resolve the existing grid heterogeneity. Such a grid can lead to a large number of unknowns. Therefore, we construct a coarse grid for the effective solution using the Generalized Multiscale Finite Element Method (GMsFEM). In this method, we construct a multiscale space using the solution of the local problems in each coarse elements. The results of the numerical solution are presented for the model problems of time-harmonic scattering in heterogeneous media.