

Regularized Meshless Method for Modified Helmholtz Equation

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Summary

In this paper, the application of Regularized Meshless Method (RMM) for the modified Helmholtz equation is presented. By means of the desingularization technique to regularize the singularity and hypersingularity of the kernel functions, source points can be located on the physical boundary. The main difficulty of the Method of Fundamental Solutions (MFS) is overcome, and the diagonal terms of influence matrices can be extracted from the non-diagonal ones. To verify the validity of formulation, numerical experiments for the propagation of oblique incident wave through a barrier are presented in which the modified Helmholtz equation is satisfied. Finally, three examples are given to show the effects of the breakwater with rigid and absorbing boundary conditions for the energy dissipation by a barrier. The transmission and reflection coefficients of the scattering problem are determined through the developed RMM program. After comparing with those of analytical solutions and the BEM results, the results are with good agreement.

keywords: oblique incident, Regularized Meshless Method, modified Helmholtz equation, Method of Fundamental Solutions, desingularization technique, barrier, transmission coefficient, reflection coefficient, energy dissipation

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