Abstracts

An Analysis of the Scalar Helmholtz Equation Using the Integral Equation Method

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The scalar Helmholtz equations are investigated by using the integral equation method (IEM). In the IEM analysis, the fundamental solution of the Laplace equation is used as a weighting function. Two IEM formulations are obtained one is a standard formulation and the other is obtained from an elimination of the unknown boundary value. The accuracy and computational time of the IEM are compared with those of the finite element method in two dimensional scalar Helmholtz problems. The analysis of a resonant cavity is reduced to a simple eigenvalue problem. Resonant frequencies of the IEM agree well with those of the finite difference method. Usefulness of the IEM is confirmed through the analyses of the scalar Helmholtz equations.

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