

Radial Point Interpolation Method for Acoustic Scattering Numerical Computation

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Abstract

This work is concerned with radial point interpolation method (RPIM) for acoustic problems addressed by the Helmholtz equation. It is common knowledge that the conventional finite element method (FEM) is unreliable to solve acoustic problems at high wavenumbers because of the interpolation as well as pollution error. Although changing the element type can make a dent in the numerical error, it led to a spike in computational cost. For only the node data needs to be prepared and element division is not required, the RPIM simplifies the data processing and thus can improve the calculation speed. Moreover, its shape functions with the Kronecker Delta function property led to easy apply of the essential boundary conditions. Numerical results show more accurate solutions with the RPIM compared with the FEM with the same node distribution.

Keywords: Meshfree method; RPIM; Acoustic Scattering