

Dispersion reduction schemes for the three dimensional acoustic wave equation
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Finite-difference (FD) methods for the wave equation are flexible, robust and easy to implement. However, they in general suffer from numerical dispersion. FD methods based on accuracy give good dispersion at low frequencies, but waves tend to disperse for higher wavenumbers. Moreover, waves in higher dimensions also suffer from dispersion errors in all propagation angles. In this work, we will give a unified methodology to derive dispersion reduction FD schemes for the three-dimensional acoustic wave equation. This new methodology would generate schemes that give the theoretical minimum dispersion error in the uniform norm. Stability criteria is given, and stability analysis is done for each generated scheme.