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Spectral element method for acoustic wave simulation in heterogeneous media. (English)

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Finite Elem. Anal. Des. 16, No. 3-4, 337-348 (1994).

We present a spectral element method for studying acoustic wave propagation in complex geological structures. Due to complexity (both lithological and stratigraphical), the use of numerical methods of higher accuracy and flexibility is needed to achieve the correct results. The spectral element method shows accurate results even for rather long wave propagation times, and dispersion errors are essentially eliminated; irregular interfaces between different media can be well described so that numerical artifacts or noises are not introduced. The method is tested against analytical solutions both in the two-dimensional homogeneous and heterogeneous media.

MSC:

74S30 Other numerical methods in solid mechanics (MSC2010)

74J10 Bulk waves in solid mechanics

65M70 Spectral, collocation and related methods for initial value and initial-boundary value problems involving PDEs

86A15 Seismology (including tsunami modeling), earthquakes

Cited in **37** Documents

Keywords:

homogeneous media; complex geological structures; long wave propagation times; irregular interfaces

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