

Session IV: Simulation of earthquake reapture, wave propagation and standard models for different tectonic settings

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Wave propagation simulation on regional scales : algorithms and applications

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Abstract

High-performance computers today allow us to approach realistic frequency bands with 3-D numerical simulations. Methods for regular-grid cartesian systems are well established. Numerical algorithms for more complicated structures like spheres, cylinders, models with complex topography, etc. are less evolved. Here we briefly summarize a recently developed algorithm which allows the numerical solution of elastic wave propagation on unstructured grids using explicit differential operators. The advantage compared to other techniques for unstructured grids (e.g. finite or spectral elements) lies in the fact that due to the local character of the operators, no matrix inversion is necessary. We also summarize results from modelling trapped mode wave propagation in fault zones, an area of seismology which - due to the many observations of such waves recently made - is a rapidly expanding field. The question which remains to be resolved is, whether fault zone waves can be used to reliably determine the structure of faults at depth. Only then an assessment of potential ruptures of fault systems would be possible.

| [PDF \(177KB\)](#) |
