EqSim

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Current version 0.6.6

Language C++

Discretization Tetrahedral cells with linear basis functions provide second-order accuracy in space and time. Tetrahedral cells permit an unstructured finite-element mesh that conforms to complex, nonplanar geometry.

Parallel implementation MPI and MPI I/O

Numerical damping The solution technique does not include artificial damping to suppress numerical noise.

Fault implementation Vertices on the fault have 6 degrees of freedom (3 for motion of the two sides of the fault together and 3 for relative motion across the fault). Kinematic ruptures specify the slip using the relative degrees of freedom; spontaneous ruptures specify a constitutive model controlling the behavior of the relative degrees of freedom.

Bulk constitutive model Isotropic linear elastic

Boundary conditions Dirichlet (prescribed displacement) and absorbing boundaries (via linear viscous dampers) in addition to natural (traction free) boundaries

Other features Support for simple static simulations and geographic coordinate systems. Support for the getting material properties from the SCEC CVM and the USGS Bay Area Velocity Model.

Documentation Source code is documented via Doxygen. There is no user manual.

Availability EqSim is not available for downloading.

Development plans EqSim is no longer being actively developed. Current development is focused on PyLith, a finite-element code for quasi-static and dynanamic modeling of earthquake faulting. PyLith is part of the Computational Infrastructure for Geodynamics (CIG) project. Binaries, source code, and documentation are available from http://www.geodynamics.org. PyLith supports multiple cell types in 1-D, 2-D, and 3-D. Quasi-static and kinematic ruptures are implemented. A release with an implementation of fault constitutive models for spontaneous rupture simulations is targeted for late 2008.

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