

CIG Software Releases

- **PyLith 1.1** - PyLith is a finite element code for the solution of visco-elastic/plastic deformation that was designed for lithospheric modeling problems. This release includes new features such as Neumann (traction) boundary conditions, absorbing boundary conditions, Dirichlet boundary conditions with displacement and/or velocity values, a generalized Maxwell viscoelastic bulk constitutive model, and output of fault and material information (state variables and diagnostic information). Also provided are a number of consistency checks to trap and report errors in the input parameters. See PyLith for source code, binaries, and manual.
- **SPECFEM3D_GLOBE 4.0.1** - SPECFEM3D_GLOBE simulates global and regional (continental-scale) seismic wave propagation. The 4.0 release includes a new doubling brick, making the mesh more accurate (in particular in the upper and mid-mantle) and perfectly load-balanced on a parallel computer; scaling all the way up to the petascale; very large number of CPUs can be used; most 1D Earth models are available; both 3D model S20RTS and model S362ANI accommodated. The package is now available under the GNU General Public License. The 4.0.1 bug fix corrected the 3D mantle model S362ANI which was improperly integrated with crustal model Crust2.0. See SPECFEM3D GLOBE for source code and manual.

Software Bug Fixes

- **CitcomS 3.0.2** - CitcomS is a finite element code designed to solve thermal convection problems relevant to Earth's mantle. This release fixes two minor bugs (one in HDF5 output which caused a compilation error and another in normalizing the tracer coordinate) and restores a feature from a previous version. This version also greatly reduces the number of tracers per element that is required for thermo-chemical convection. See CitcomS for source code and manual. You can also run this latest version of CitcomS on the TeraGrid.
- **Gale 1.2.2** - Gale is a 2D/3D code that solves problems related to orogenesis, rifting, and subduction with coupling to surface erosion models. This latest release is now extensively benchmarked, and includes parallel VTK output and a rough implementation of friction. Several bugs are also fixed. Gale is a joint effort between CIG, Victorian Partnership for Advanced Computing (VPAC), and Monash University. See Gale for binaries, source code, and manual.
- **SPECFEM3D 1.4.3** - SPECFEM3D_BASIN, renamed simply SPECFEM3D, is now available under the GNU General Public License. The latest version adds the Moho boundary kernel computation option for kernel simulations and allows kernel computations with attenuation on. Also offered is the possibility of replacing Hauksson's background model by Lin's most recent southern California tomographic model. See SPECFEM3D for source code and manual.

Software Additions to CIG Website

- **SEISMIC_CPML** - SEISMIC_CPML is a set of six Fortran90 programs that solve the 2D or 3D isotropic or anisotropic elastic wave equation using a finite-difference method with Convolutional Perfectly Matched Layer (C-PML) conditions, developed by Dimitri Komatitsch and Roland Martin from University of Pau, France. See SEISMIC_CPML for source code and link to documentation.
- **SPECFEM2D** - SPECFEM2D simulates seismic wave propagation in two-dimensional anisotropic viscoelastic or coupled viscoelastic-acoustic media. See SPECFEM2D for source code and readme.
- **SPECFEM1D** - SPECFEM1D is a small code that allows users to learn how a spectral-element program is written. See SPECFEM1D for source code, which contains self-explanatory comments.

MAG Portal Released

- **Use the MAG Portal to Avoid Compiling, Queue Jobs.** The MAG Portal allows users to run the geodynamo code MAG without compiling it locally. MAG is a serial version of a rotating spherical convection/magneto-convection/dynamo code that solves the non-dimensional Boussinesq equations for time-dependent thermal convection in a rotating spherical shell filled with an electrically conducting fluid. The portal allows you to create and submit a MAG job to a selected TeraGrid site, monitor its progress and, when complete, download a tar-ball with the job results to further analyze locally or visualize with IDL software. You can also queue up a long serial run rather than tie up your local machine. See the MAG Portal.

Upcoming Meetings

- **2008 Workshop on Numerical Modeling of Crustal Deformation and Earthquake Faulting, June 23-27, 2008, Colorado School of Mines, Golden, CO.** The focus of this gathering will be on computational models addressing the seismic cycle across single and multiple events. The workshop blends science talks on case studies from particular faulting environments and on key rheological behavior with discussions of current obstacles to crustal deformation modeling. The first four days (Monday-Thursday) will be a mixture of science talks, discussion, and hands-on tutorials. The fifth day (Friday) is dedicated to informal tutorials and collaboration. See workshop announcement for links to registration and other details.
- **Workshop for Advancing Numerical Modeling of Mantle Convection and Lithospheric Dynamics, July 9-11, 2008, UC Davis.** This workshop on Numerical Modeling of Mantle and Lithospheric Dynamics will build on the success of the 2005 Boulder workshop on Mantle Convection, but be broader in terms of audience than the Boulder workshop in that we will bring together both the mantle convection and lithospheric dynamics communities. Plans are to discuss scientific advances and, importantly, technical and scientific issues related to the quantitative modeling of the origin and evolution of the mantle-lithosphere system. Conveners: Magali I. Billen (UC Davis), Jolante van Wijk (LANL), Scott King (Virginia Tech), and Thorsten Becker (USC). See workshop announcement for registration form and other useful information.

CIG Receives LRAC Allocation for Science Gateway, Community Code Support


- In order to continue support of the Seismology Science Gateway (which offers a web interface to run SPECFEM3D_GLOBE and MAG) and gain sufficient TeraGrid allocations to perform benchmarking, training sessions, and nurturing new users, CIG requested an upgrade for its MRAC to a Large Resource Allocations Committee (LRAC) on Jan. 11, and was granted an additional 300,000 SUs on March 12. View the PDF proposal at CIG Science Gateway and Community Codes for the Geodynamics Community.

CIG Grants Sub-Award for AMR Development


- CIG granted a sub-award to Wolfgang Bangerth at Texas A&M University to continue developing the deal.II (which provides


infrastructure code on which applications supporting adaptive mesh refinement can rapidly be built) into a library with wide applicability to geodynamics. Under this project, Bangerth will produce a suite of programs that demonstrates using this technology for geodynamics applications. For more details, see [A suite of simple geodynamics applications using adaptive finite element methods](#).


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