

Plasticity Models

This repository contains supplementary [TerraFERMA](#) model files to accompany the paper

Spiegelman, M, David May and Cian R Wilson, *Lessons and insights into effective solvers for visco-plasticity in geodynamics*, submitted to GCubed, 2015

Contents

This repo contains the directories

- **solver_strategies:** Directories containing input files for describing and running three different models and producing Figures 2,3,5,6 and 10 in the paper
 - **successive_substitution:** Picard iteration/Approximate Newton methods
 - **newton:** Hybrid Picard-Newton schemes
 - **alpha-continuation:** Newton with continuation in the α parameter
- **meshes:** gmsh input files and Dofin Meshes used in the models
- **paraview:** Paraview State files for assisting visualization of model results

Running the Models

- **Install TerraFERMA:** To view and run these models you will need to build and install the open source code [TerraFERMA](#) (which can take some time, but is currently [supported](#) on most flavors of linux and Mac OSX). Detailed instructions can be found on the [Wiki](#). We suggest using our [Dorsal Scripts](#) for installation.
- **Running Models:** Once the software is installed models can be run from within each subdirectory using

```
$ tfsimulationharness --test <filename>.shml
```

where `<filename>.shml` is the name of the *simulation harness* file that controls parameter sweeps, organizes multiple runs, collects data and produces PDF plots of the results. The actual models are described in the *TerraFERMA* markup language files with suffix `.tfml`.

- **Viewing Input files:** both `.tfml` and `.shml` files can be viewed and manipulated using the [SPuD](#) gui `diamond` i.e

```
$ diamond <filename>.tfml
```

Questions and Comments

Please address any questions or comments on these files through the [issue tracker](#) or send e-mail to mspieg@ldeo.columbia.edu