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 Dolfin 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 through the issue tracker