Soildynamics Tutorials for PSD - Parallel 2D with double couple

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Abstract

This document details some tutorials of soildynamics module of PSD. These tutorials are not verbose, but does instead give a kick start to users/developers for using PSD's soildynamics module.

In the 2D problem above seismic sources was supplied on the border, in the current one the source is more realistic and comes from a double couple (point Dirichlet condition). The double couple boundary condition is a way to impose moments caused by faults that create earthquakes, here in this problem double couple is imposed using displacement based.

```
1 PSD_PreProcess -dimension 2 -problem soildynamics -timediscretization newmark_beta \
2 -useGFP -doublecouple displacement_based -postprocess uav
```

Once the step above has been performed, we solve the problem using two MPI processes, with the given mesh file soil-dc.msh.

```
1 PSD_Solve -np 2 Main.edp -v 1 -ns -nw -mesh ./../Meshes/2D/soil-dc.msh
```
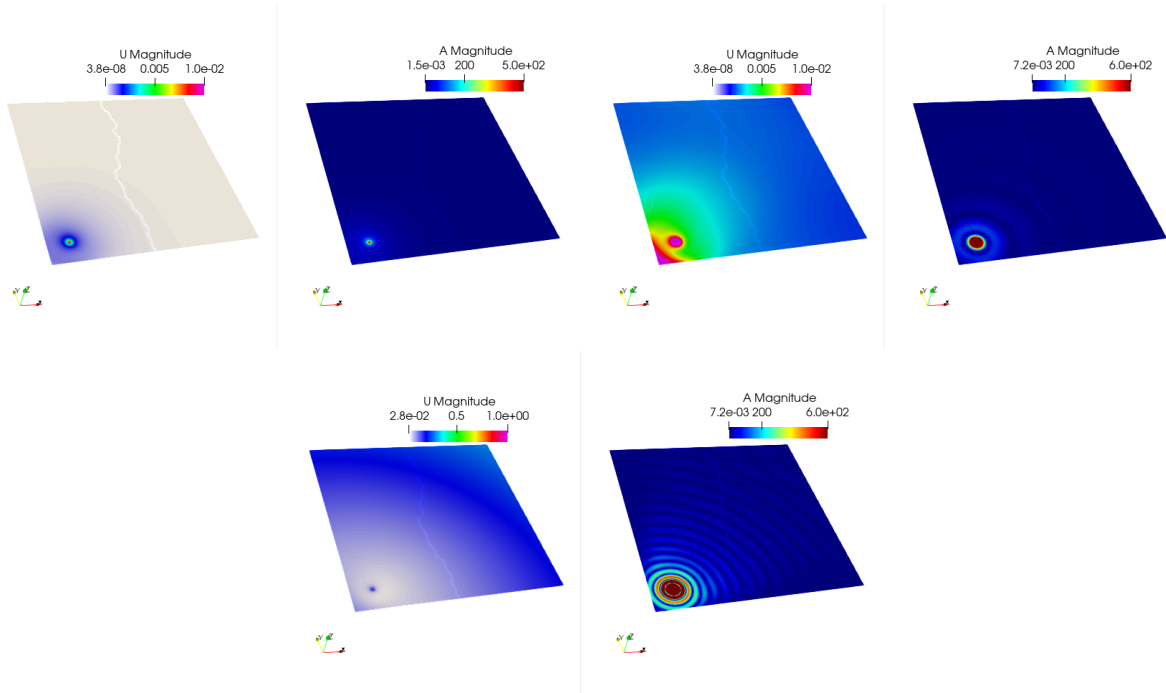

Figure 1: Finite element displacement and acceleration fields visualized for the 2D problem with ParaView at different timesteps.

Using ParaView for postprocessing the results that are provided in the VTUs... folder, results such as those shown in figure~1 can be extracted.

Similarly try out the 3D problem. However take note that a the mesh ./../Meshes/2D/soil-dc.msh is not provided, so you will have to create your own mesh.