

# Soildynamics Tutorials

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## Parallel 2D with 4 MPI processes

Single Dirichlet condition

```
PSD_PreProcess -dimension 2 -problem soildynamics -dirichletconditions 1 \  
-timediscretization newmark-beta
```

```
PSD_Solve -np 4 Main.edp -mesh ../../Meshes/2D/soil.msh -v 0
```

## Parallel 3D with 3 MPI processes

Single Dirichlet condition and Newmark-beta time discretization

```
PSD_PreProcess -dimension 3 -problem soildynamics -dirichletconditions 1 \  
-timediscretization newmark-beta
```

```
PSD_Solve -np 3 Main.edp -mesh ../../Meshes/3D/soil.msh -v 0
```

## Parallel 2D with double couple with 2 MPI processes

Single Dirichlet via double couple and using GFP. Double couple is displacement based.

```
PSD_PreProcess -dimension 2 -problem soildynamics -model linear \  
-timediscretization newmark-beta -useGFP -doublecouple displacement-based
```

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

*try replacing `-doublecouple displacement-based` with `-doublecouple force-based` for double couple constructed by force based method*

## Parallel 3D with double couple with 4 MPI processes

Single Dirichlet via double couple and using GFP. Double couple is displacement based.

```
PSD_PreProcess -dimension 3 -problem soildynamics -model linear \  
-timediscretization newmark-beta -useGFP -doublecouple displacement-based
```

```
PSD_Solve -np 4 Main.edp -v 1 -ns -nw -mesh ../../Meshes/2D/soil-dc.msh
```

try replacing `-doublecouple displacement-based` with `-doublecouple force-based` for double couple constructed by force based method

## Parallel 3D with top-ii-vol meshing with 4 MPI processes

Single Dirichlet at the bottom and using GFP.

```
PSD_PreProcess -dimension 3 -problem soildynamics -model linear \  
-timediscretization newmark-beta -useGFP -top2vol-meshing
```

```
PSD_Solve -np 4 Main.edp -v 0 -ns -nw
```

## Parallel 3D with top-ii-vol meshing with 3 MPI processes

Single Dirichlet via double couple and using GFP. Double couple is displacement based.

```
PSD_PreProcess -dimension 3 -problem soildynamics -model linear \  
-timediscretization newmark-beta -useGFP -top2vol-meshing -doublecouple  
displacement-based
```

```
PSD_Solve -np 3 Main.edp -v 0 -ns -nw
```

try replacing `-doublecouple displacement-based` with `-doublecouple force-based` for double couple constructed by force based method

- Optionally try using `-timediscretization generalized-alpha` instead of `-timediscretization newmark-beta` to change time discretization scheme
- Add `-sequential` flag to `PSD_PreProcess` for sequential solver, but remember to use `PSD_Solve_Seq` instead of `PSD_Solve`