Colliding Disks

Problem Description

This is an implementation of an example calculation from [1] in which two elastic disks collide and rebound. See Section 7.3 of that manuscript for a description of the problem.

Simulation Specifics

Component used: MPM

Input file name: disks_sulsky.ups

Command used to run input file: sus disks_sulsky.ups

Simulation Domain: 1.0 x 1.0 x 0.05 m

Cell Spacing:
.05 x .05 x .05 m (Level 0)

Example Runtimes:
1 minute (1 processor, 3.0 GHz Xeon)

Physical time simulated: 3.0 seconds

Associate scirun network: disks.srn

Results

Figure 1 shows a snapshot of the simulation, as the disks are beginning to collide.

Additional data is available within the uda in the form of "dat" files. In this case, both the kinetic and strain energies are avaiable and can be plotted to create a graph similar to that in Fig. 5a of [1]. e.g. using gnuplot:

```
cd disks.uda.000
gnuplot
gnuplot> plot "StrainEnergy.dat", "KineticEnergy.dat"
gnuplot> quit
```

References

[1] D. Sulsky, Z. Chen, and H. L. Schreyer. A particle method for history-dependent materials. *Comp. Methods Appl. Mech. Engrg.*, 118:179–196, 1994.

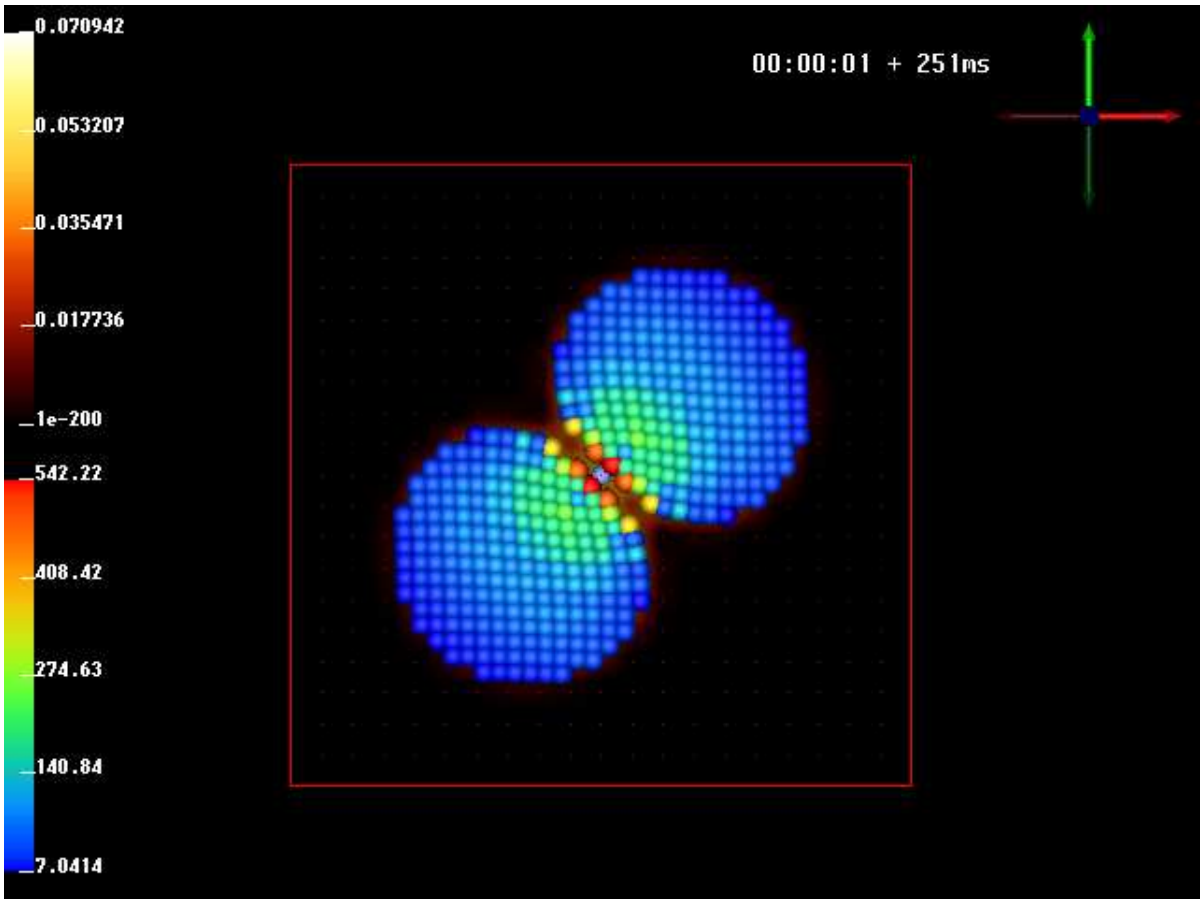

Figure 1: Colliding elastic disks. Particles colored according to equivalent stress, grid according to nodal mass.