NumericalBox3D DLSM
Part III: Preprocessor-01

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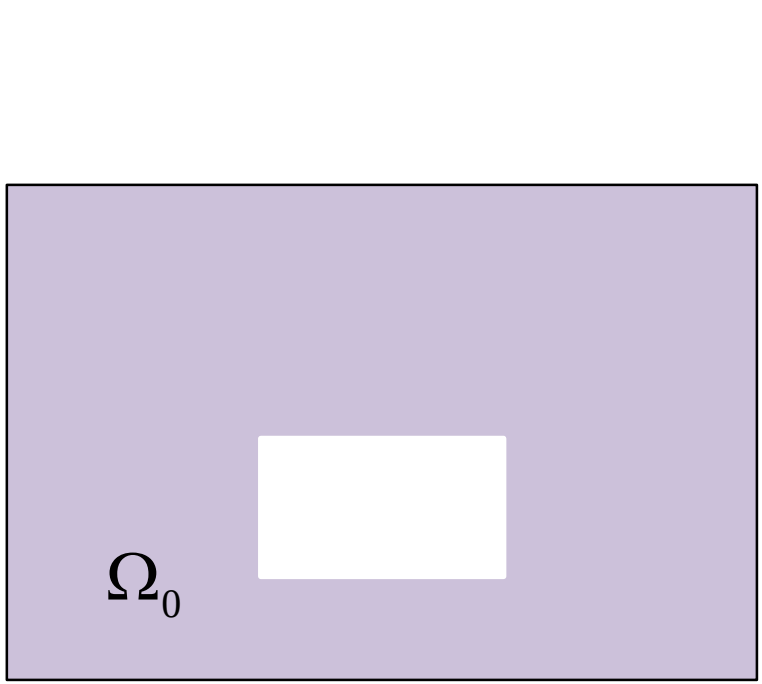
www.dembox.org

Model Generation

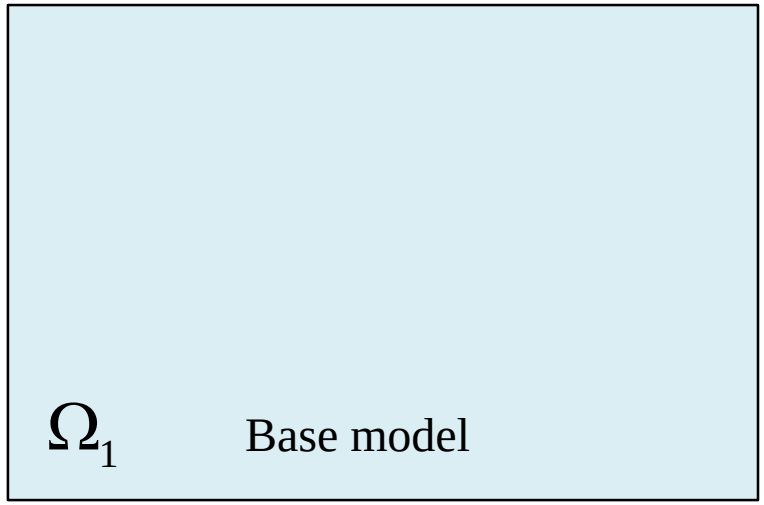
Principle-I

Top-down Concept

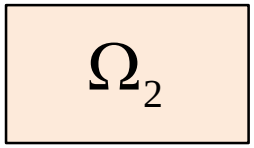


$$\Omega_0 = [\Omega_1 - \Omega_2]$$

Boolean operation



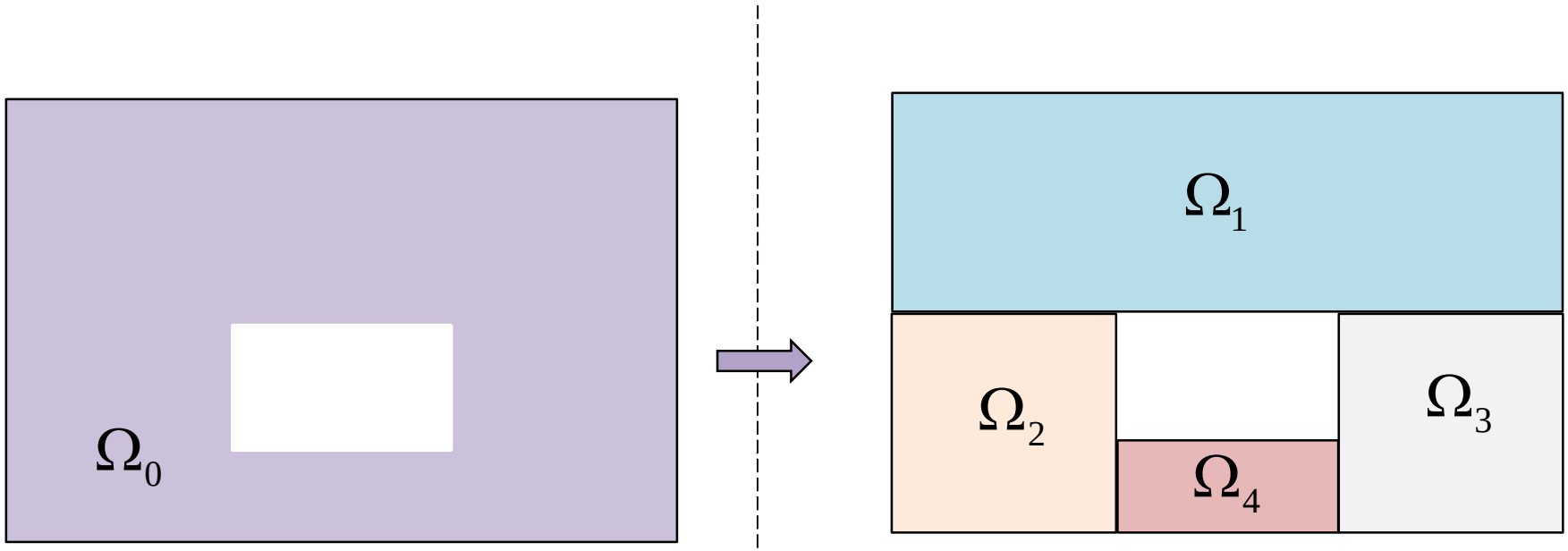
Cutting operation



Basic Shape 2

Principle-II

Bottom-up Principle

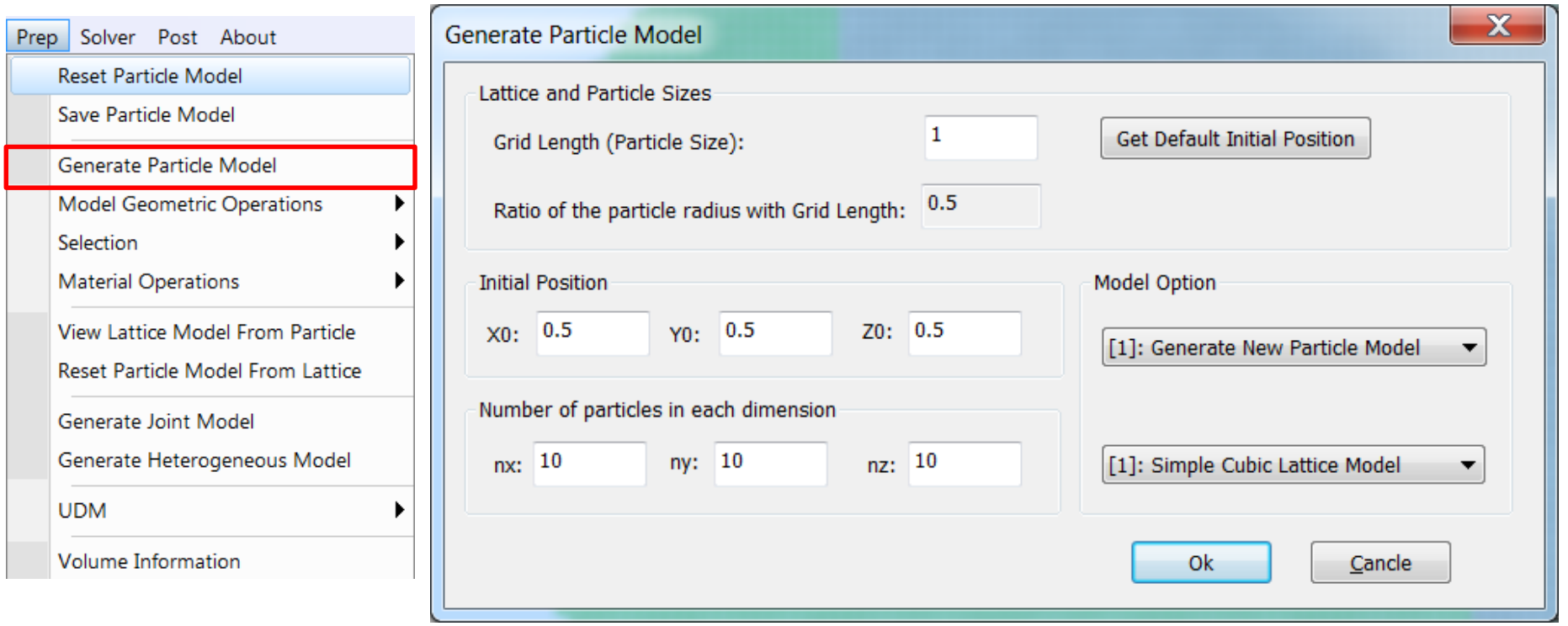


$$\Omega_0 = \left[\Omega_1 + \Omega_2 + \Omega_3 + \Omega_4\right]$$

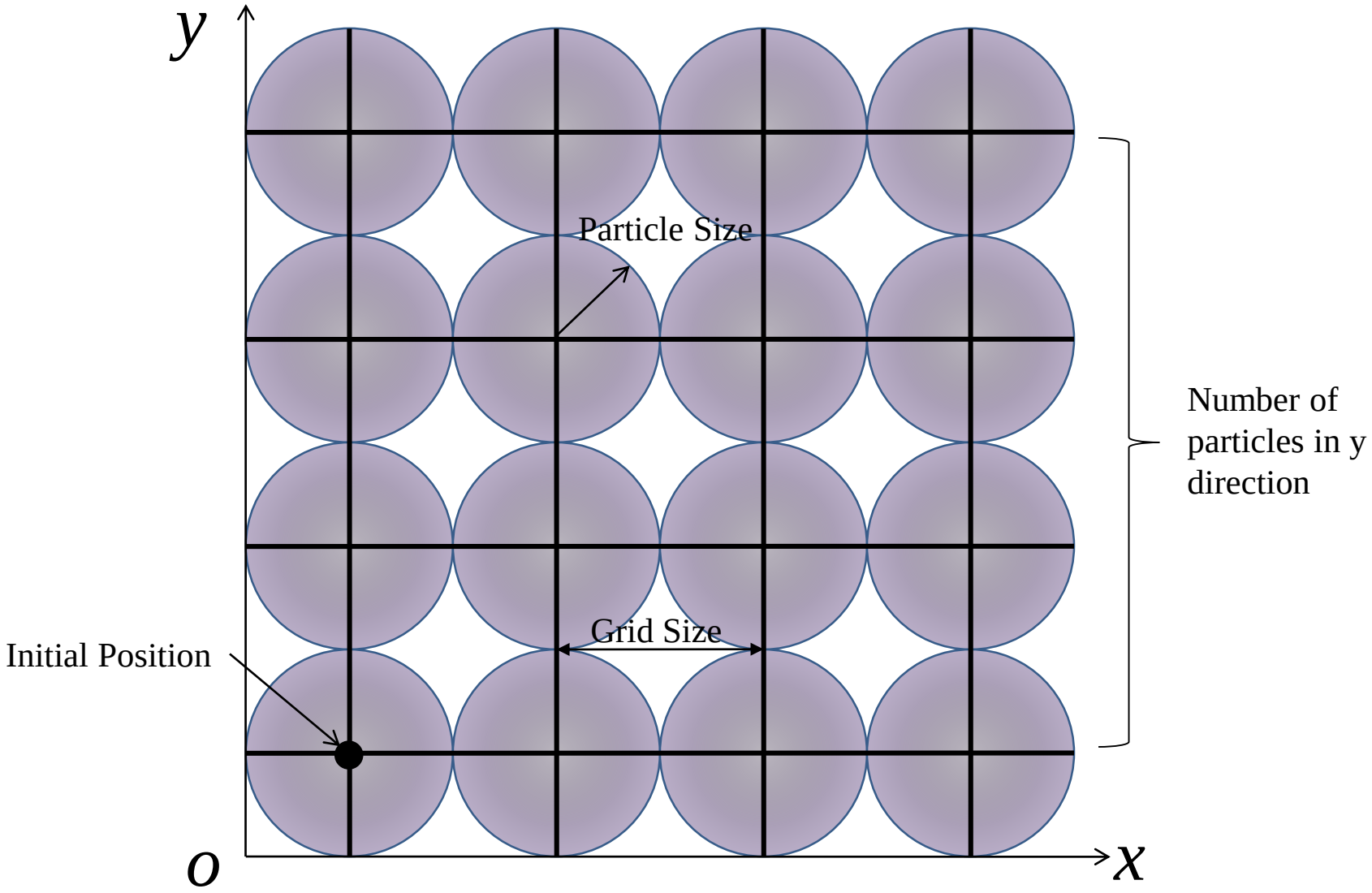
Boole operation

Base Generation

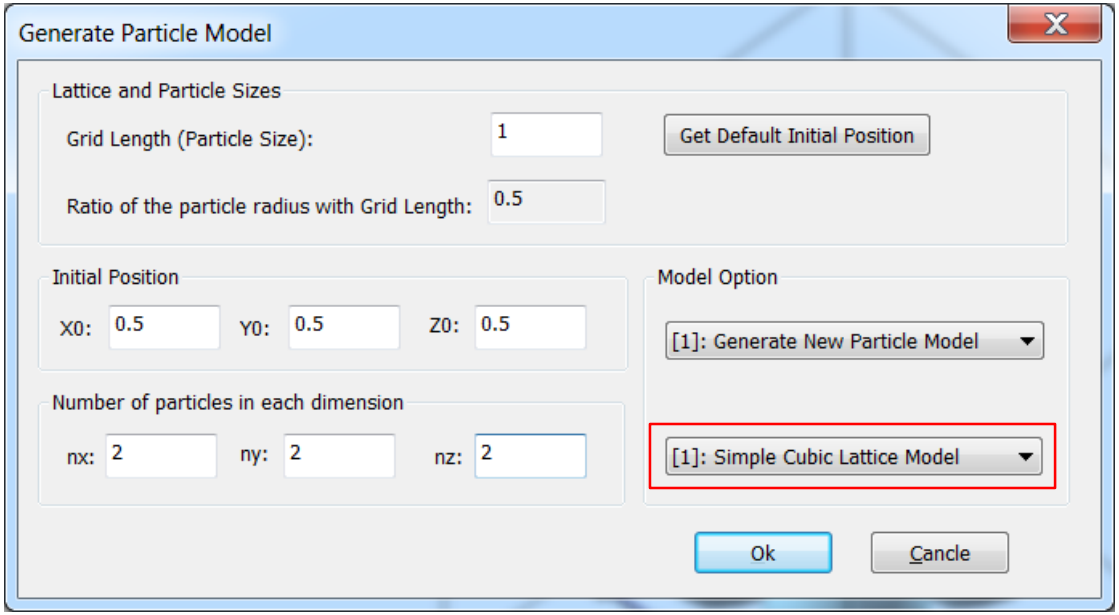
The GUI

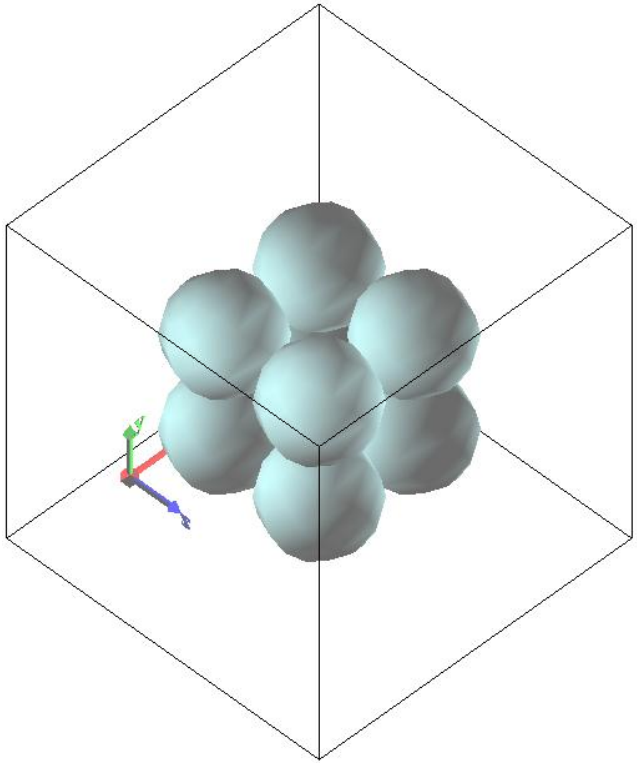

Prep
Solver
Post
About
Reset Particle Model
Save Particle Model
Generate Particle Model
Model Geometric Operations
Selection
Material Operations
View Lattice Model From Particle
Reset Particle Model From Lattice
Generate Joint Model
Generate Heterogeneous Model
UDM
Volume Information
Generate Particle Model
Lattice and Particle Sizes
Grid Length (Particle Size):
1
Get Default Initial Position
Ratio of the particle radius with Grid Length:
0.5
Initial Position
X0:
0.5
Y0:
0.5
Z0:
0.5
Model Option
[1]: Generate New Particle Model
Number of particles in each dimension
nx:
10
ny:
10
nz:
10
[1]: Simple Cubic Lattice Model
Ok
Cancle

Parameters

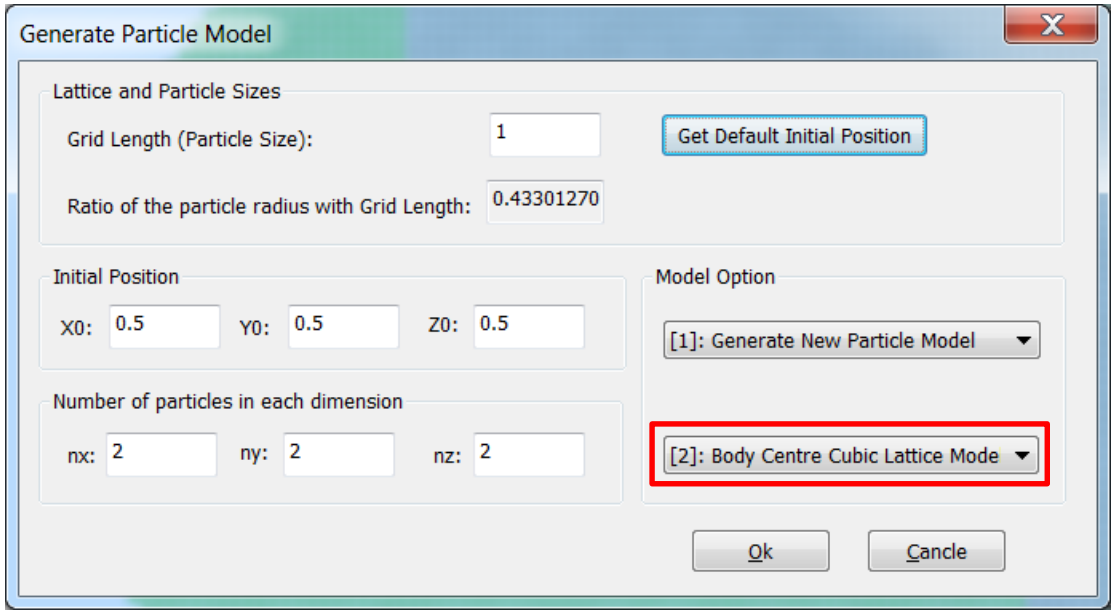

y
Particle Size
Number of particles in y direction
Grid Size
Initial Position
o
x

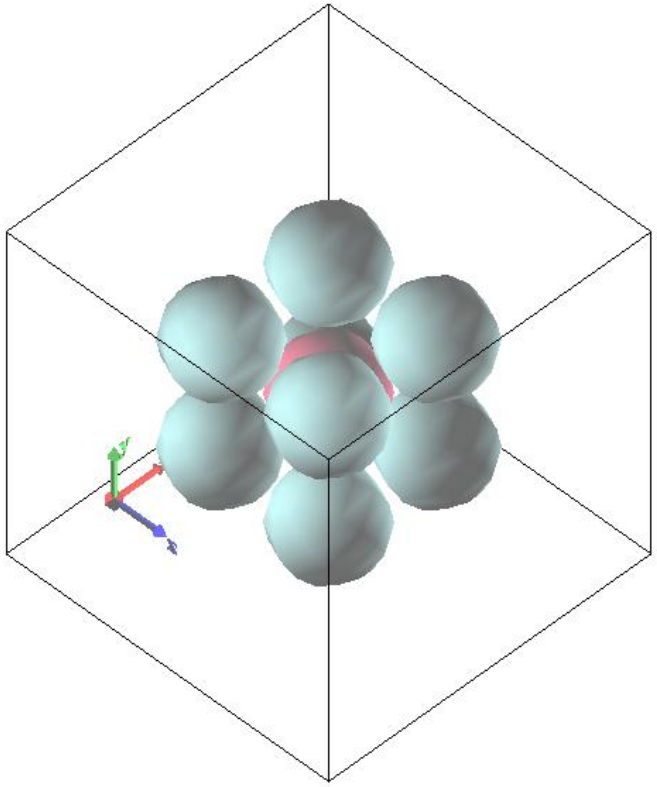
Simple Cubic



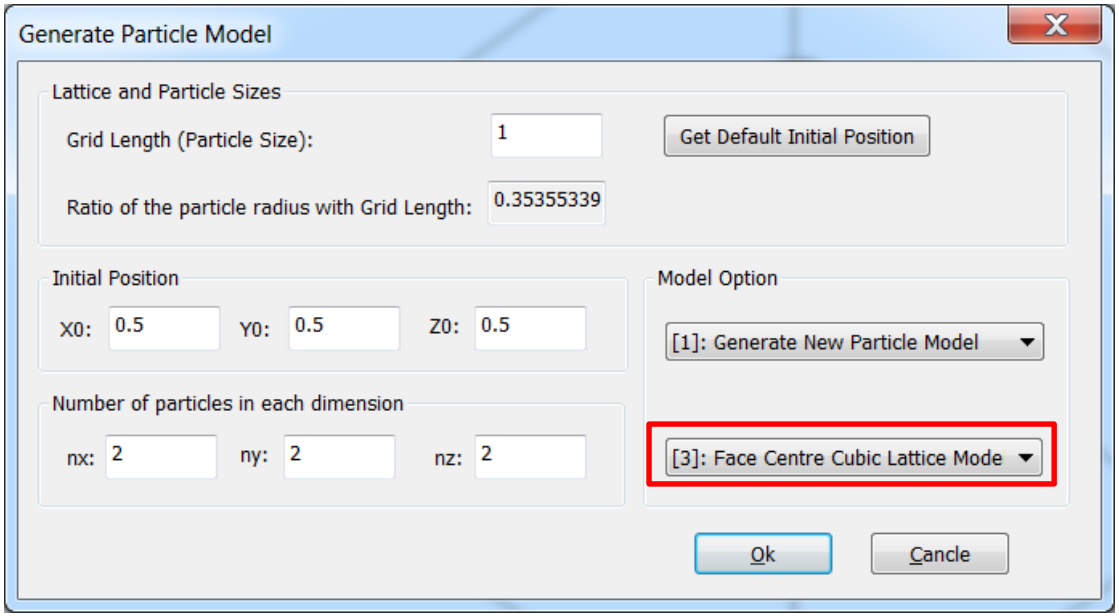


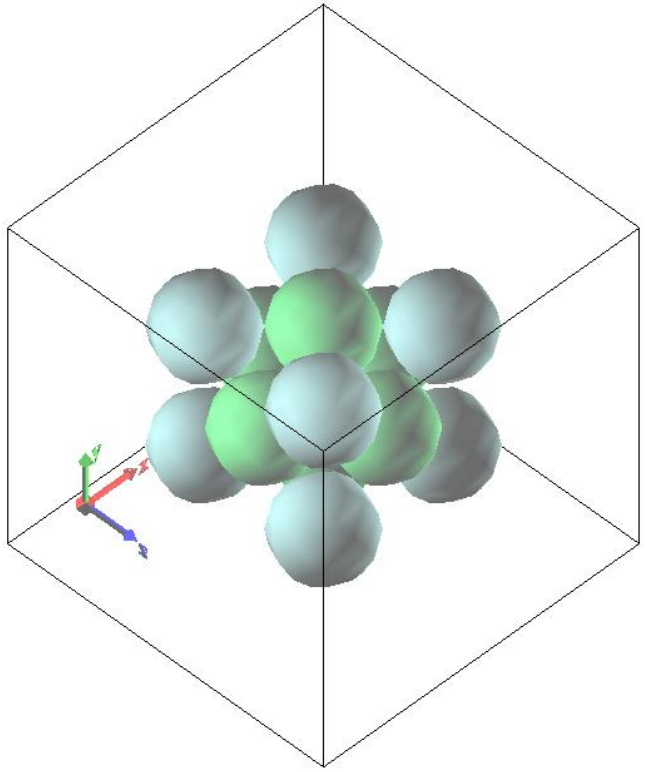
BCC


Generate Particle Model
Lattice and Particle Sizes
Grid Length (Particle Size):
1
Get Default Initial Position
Ratio of the particle radius with Grid Length:
0.43301270
Initial Position
X0:
0.5
Y0:
0.5
Z0:
0.5
Model Option
[1]: Generate New Particle Model
Number of particles in each dimension
nx:
2
ny:
2
nz:
2
[2]: Body Centre Cubic Lattice Mode
Ok
Cancle



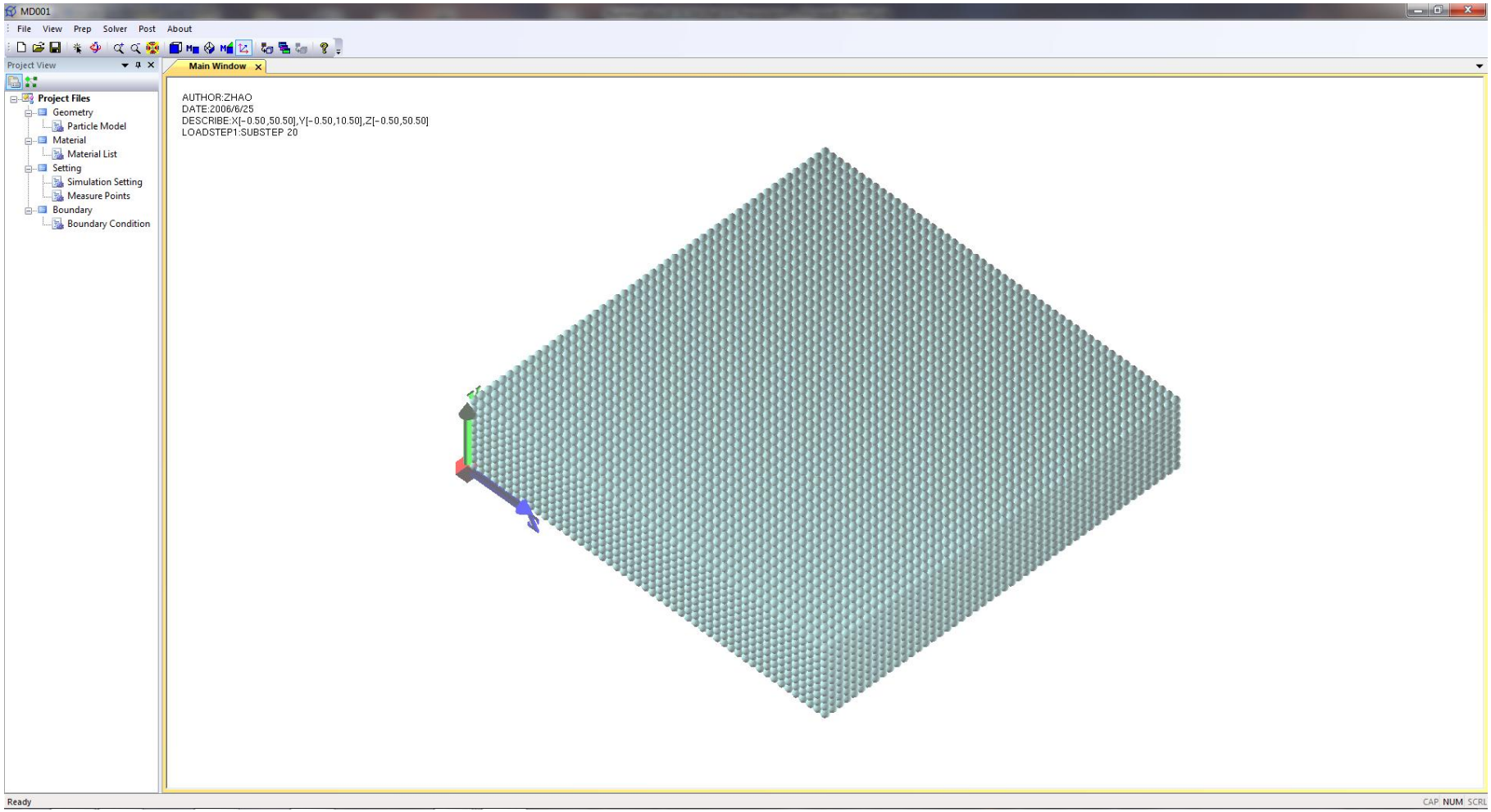
FCC


Generate Particle Model
Lattice and Particle Sizes
Grid Length (Particle Size):
1
Get Default Initial Position
Ratio of the particle radius with Grid Length:
0.35355339
Initial Position
X0:
0.5
Y0:
0.5
Z0:
0.5
Model Option
[1]: Generate New Particle Model
Number of particles in each dimension
nx:
2
ny:
2
nz:
2
[3]: Face Centre Cubic Lattice Mode
Ok
Cancle



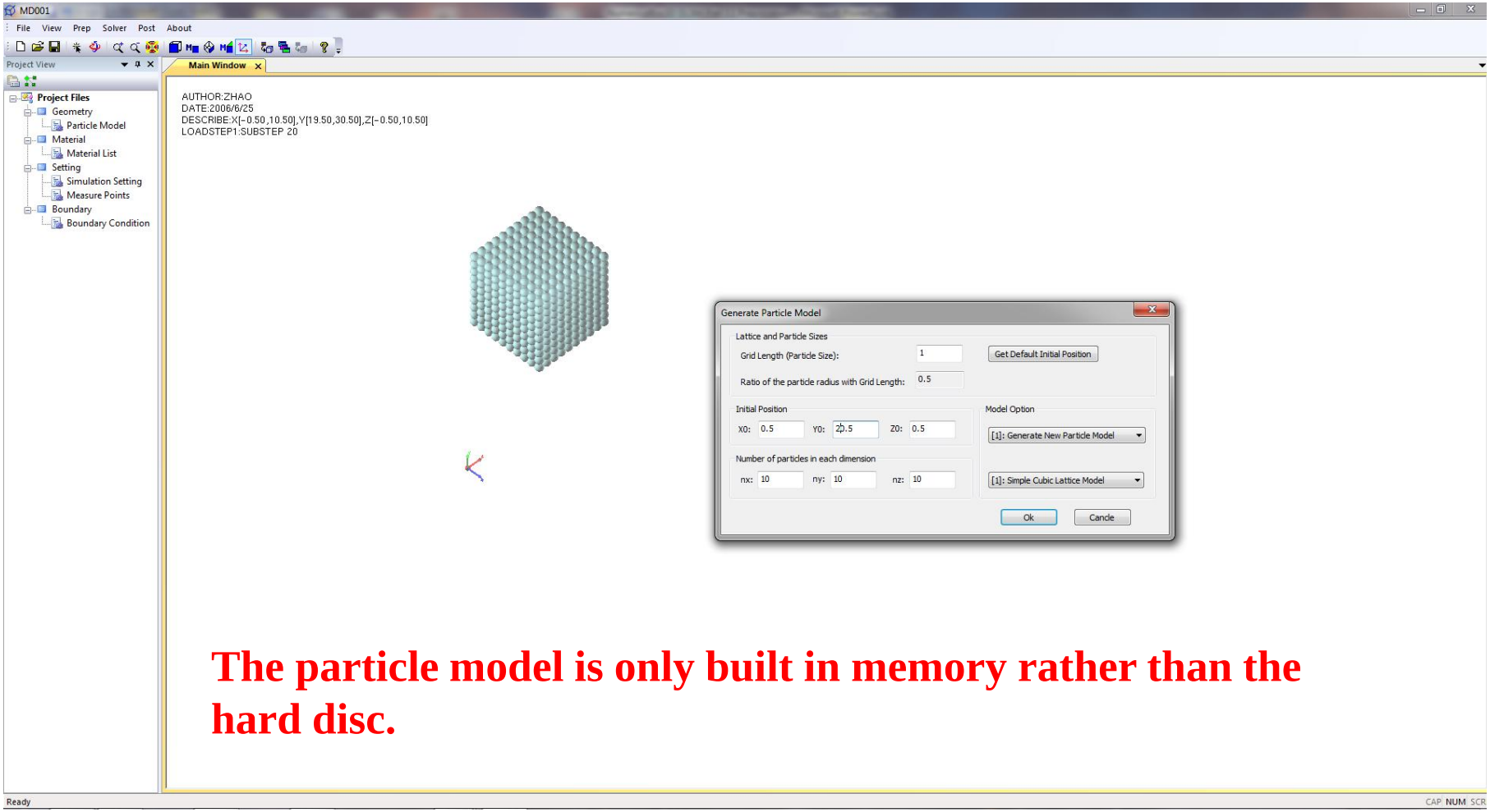
Generate New Particle Model

Step 1: The exist model



Generate New Particle Model

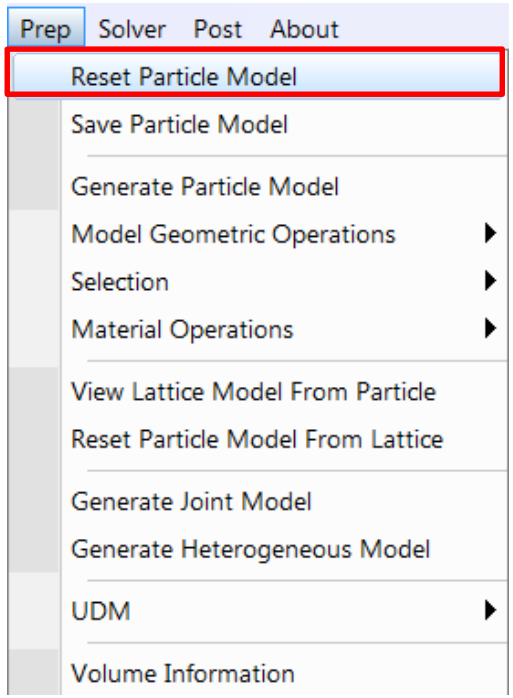
Step 2: After Generate New Particle Model

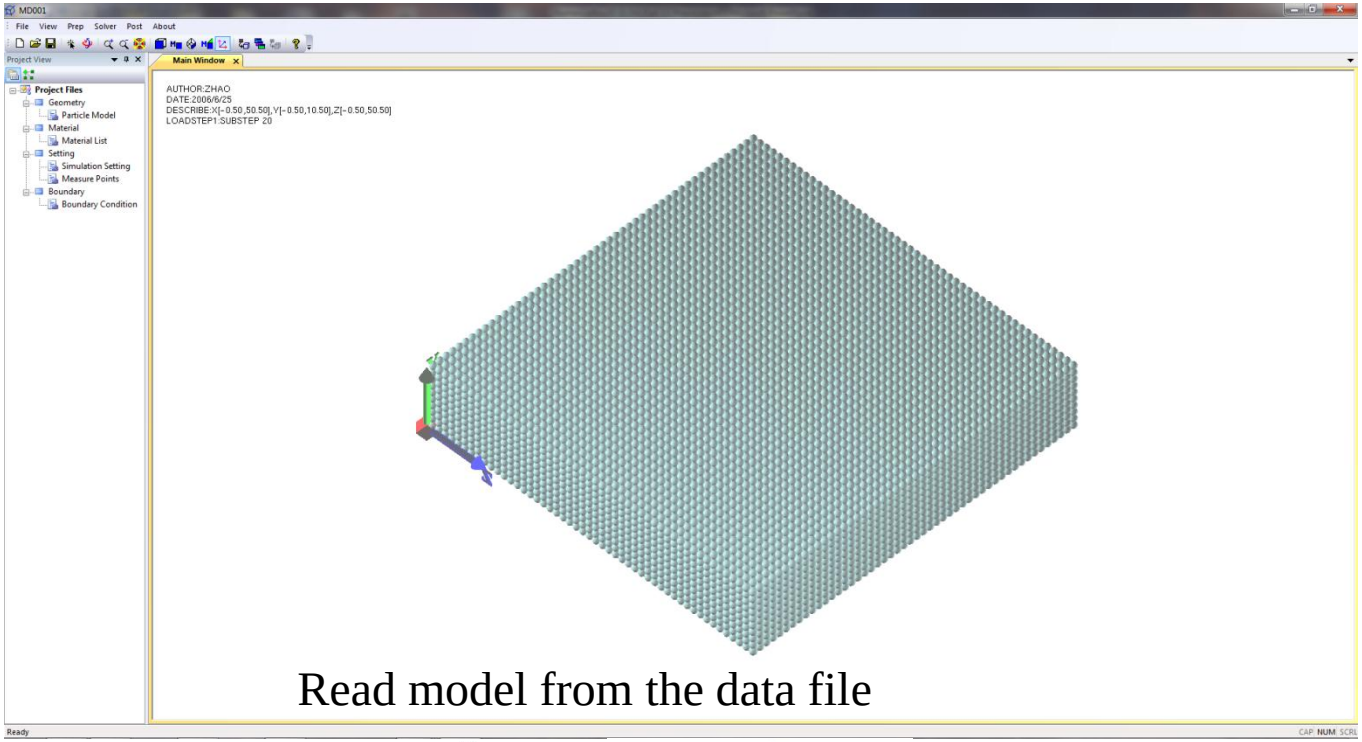


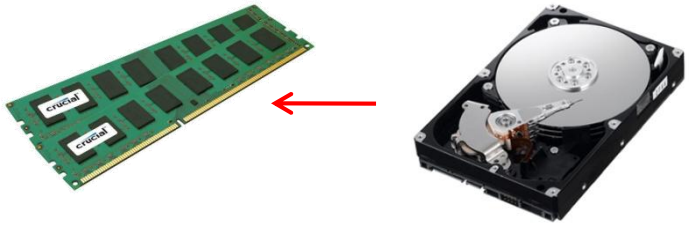
The particle model is only built in memory rather than the hard disc.

Reset Particle Model

Reset the particle model from the data file (the saved model)

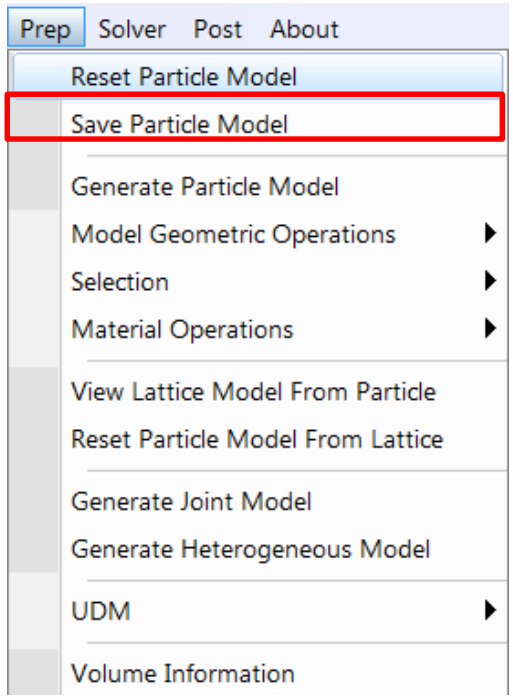


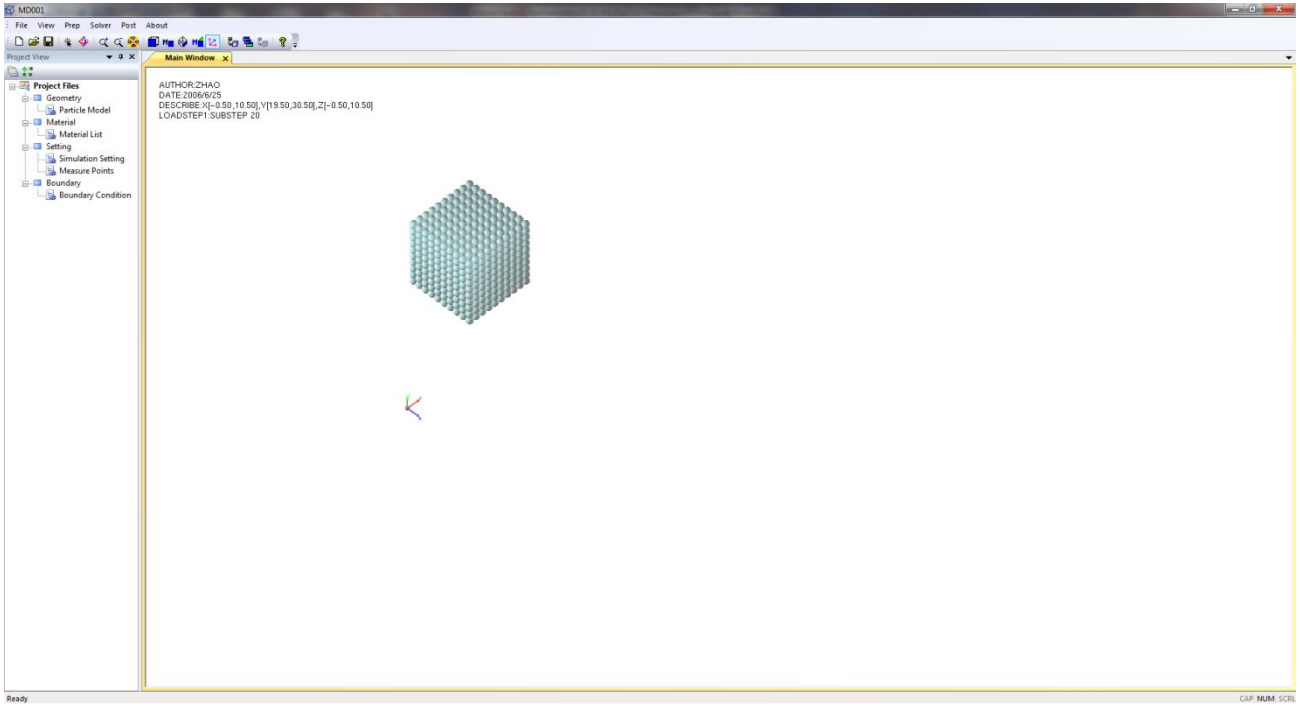


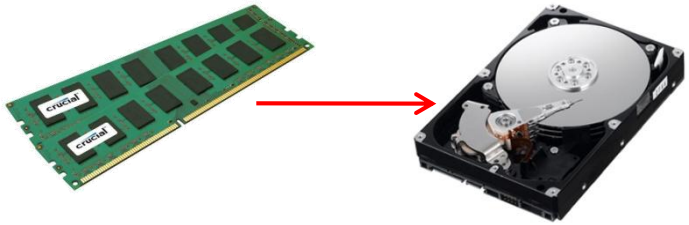


Save Particle Model

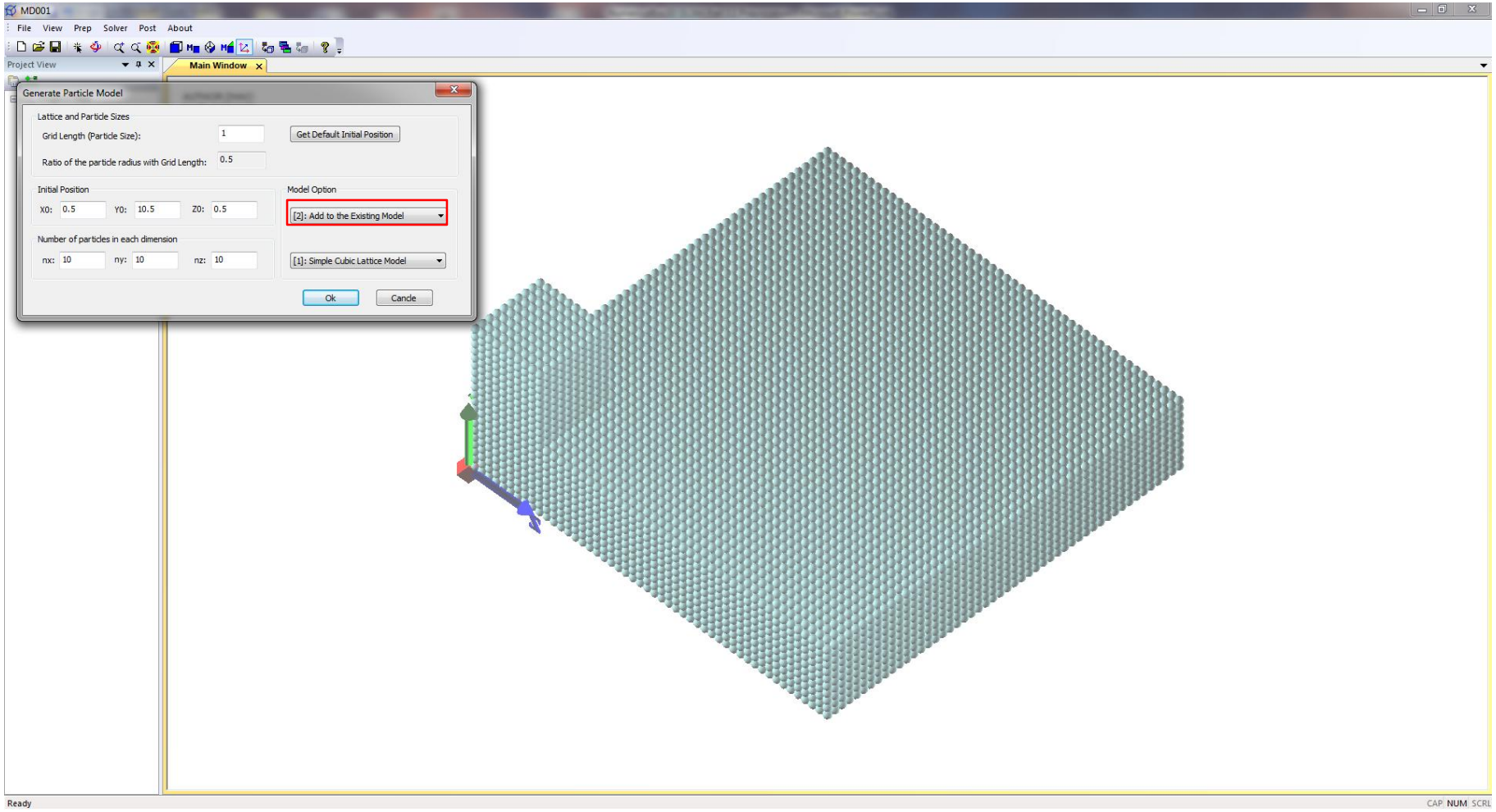
Save the particle model to data file





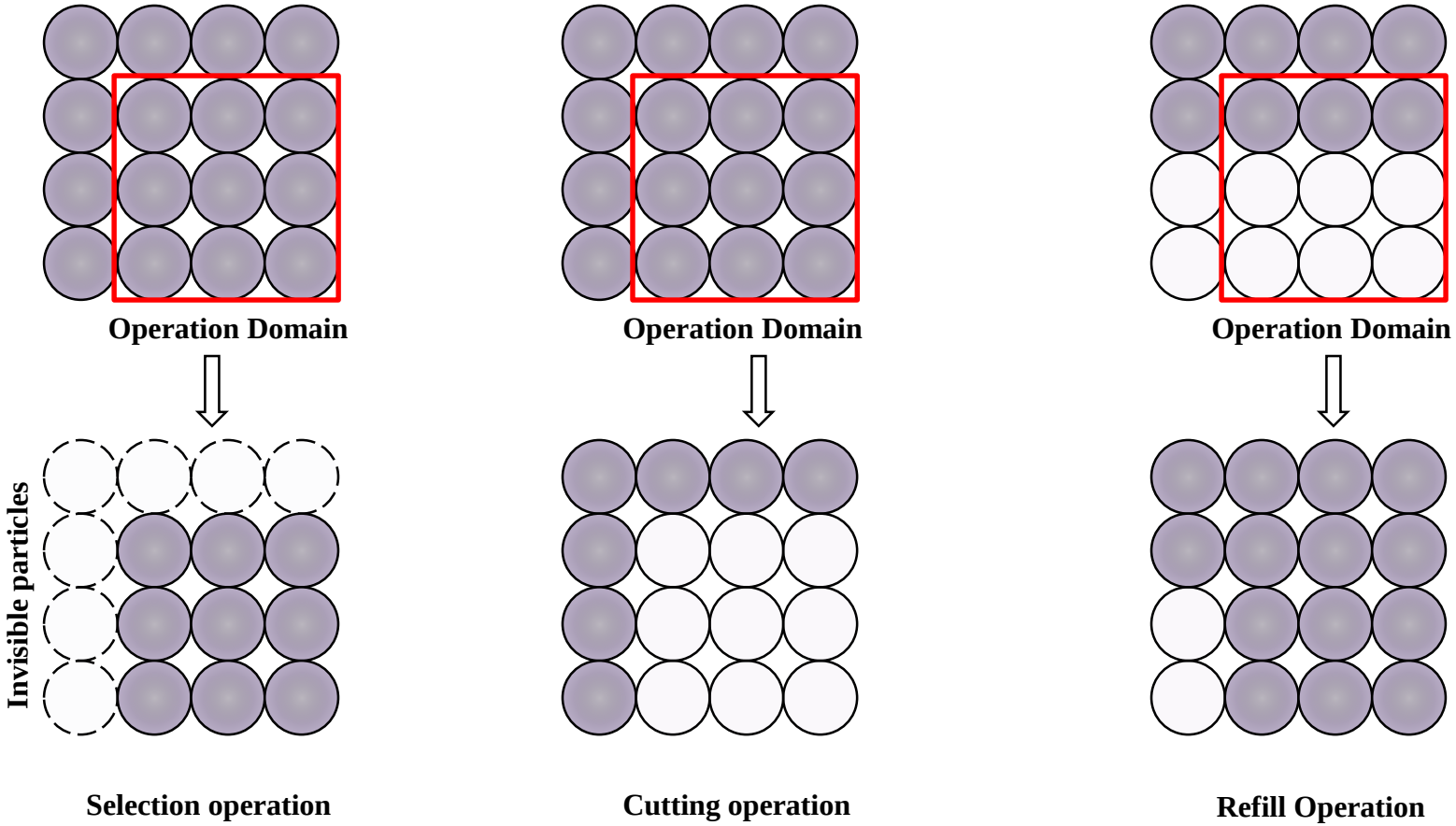


Add to the Existing Model



Boolean Operation

Boolean Operation

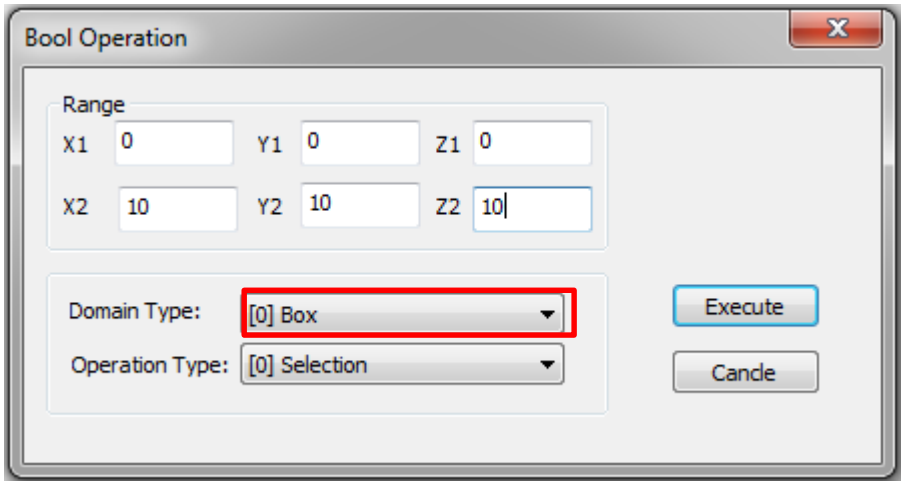


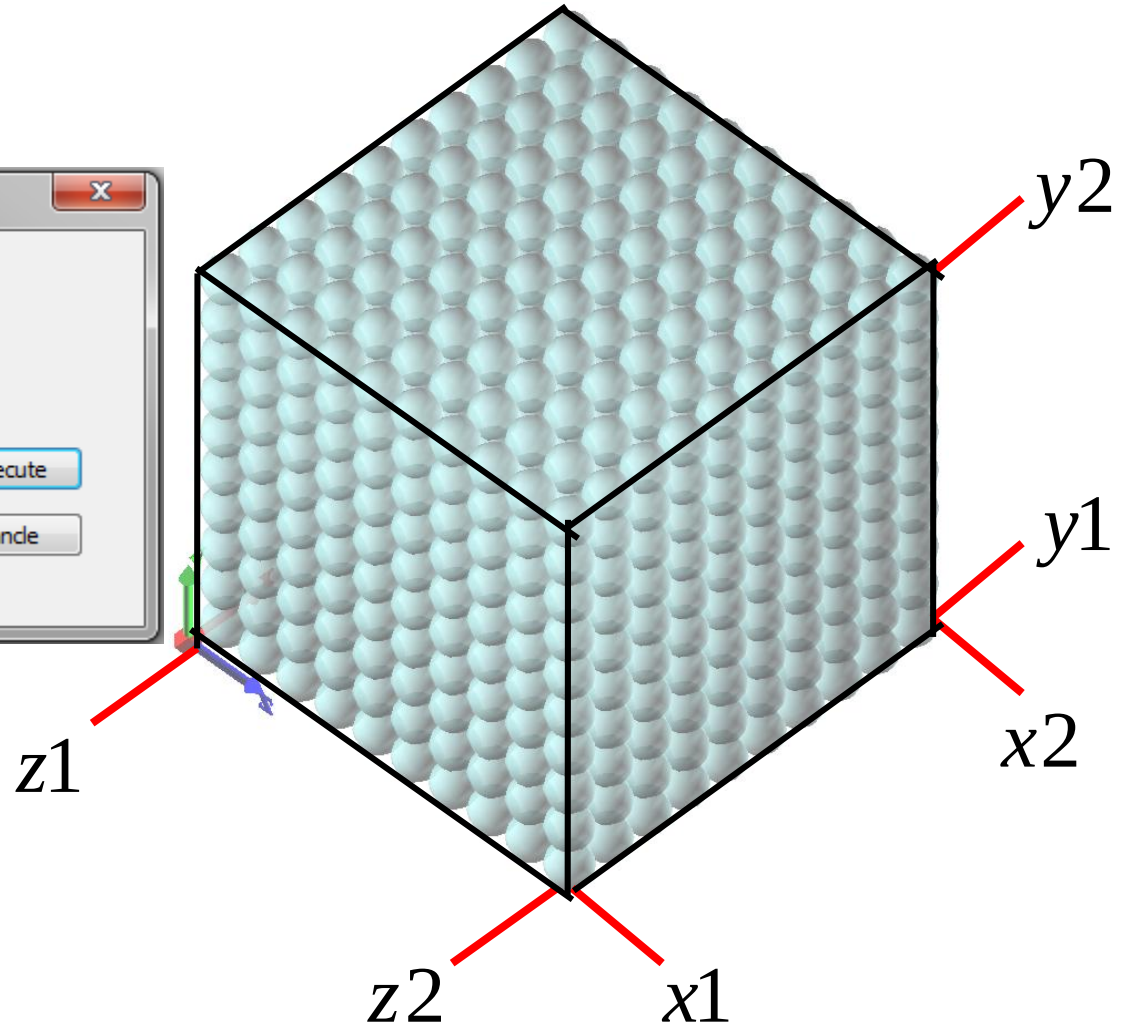
✓**The operation will only modify the visibility of the particles;**

✓**Only visible particles will be saved to the data file.**

Operation Domain

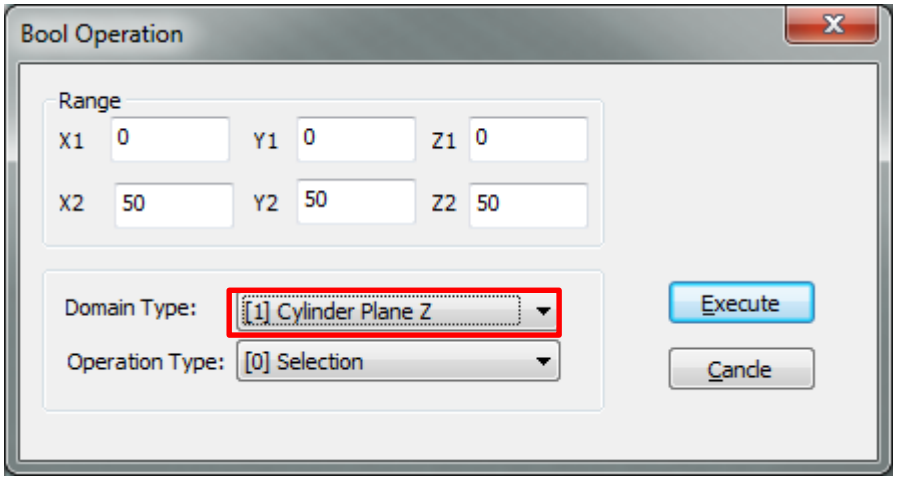
Box

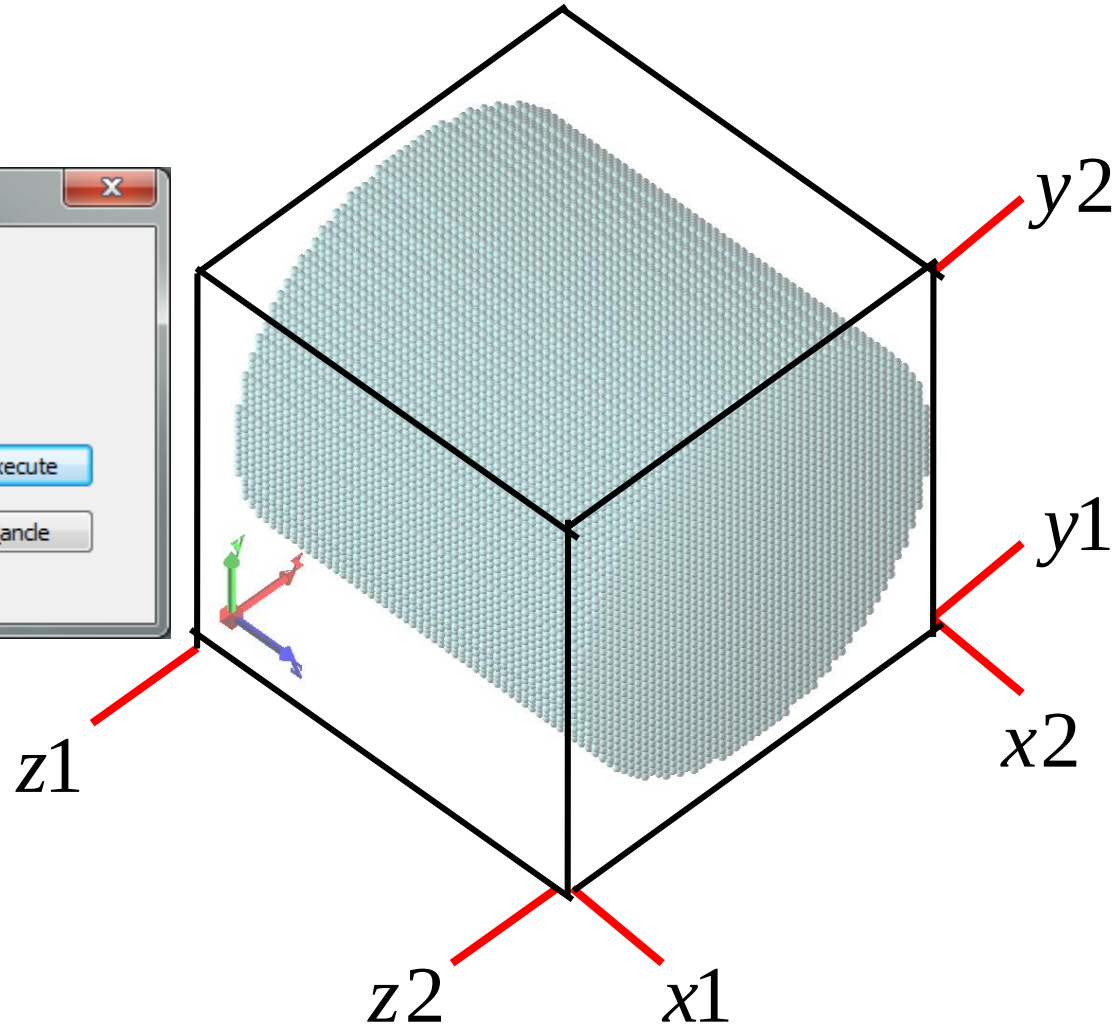




Operation Domain

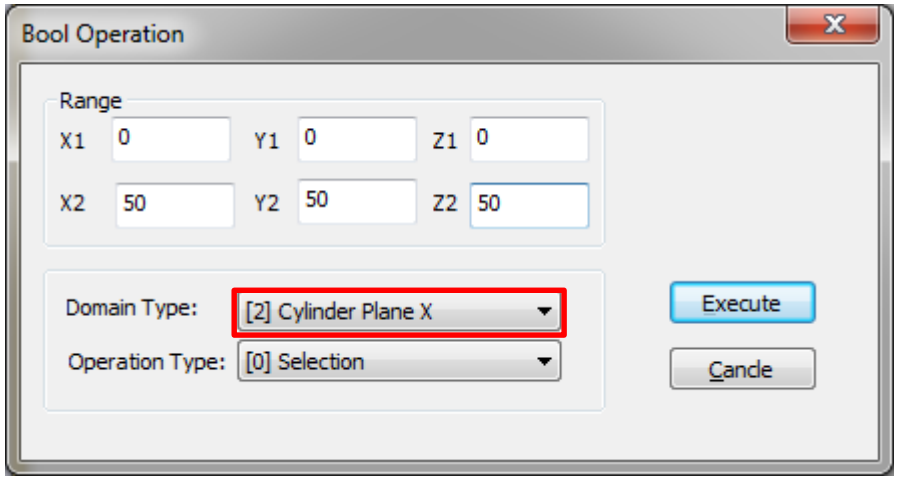
Cylinder Plane Z

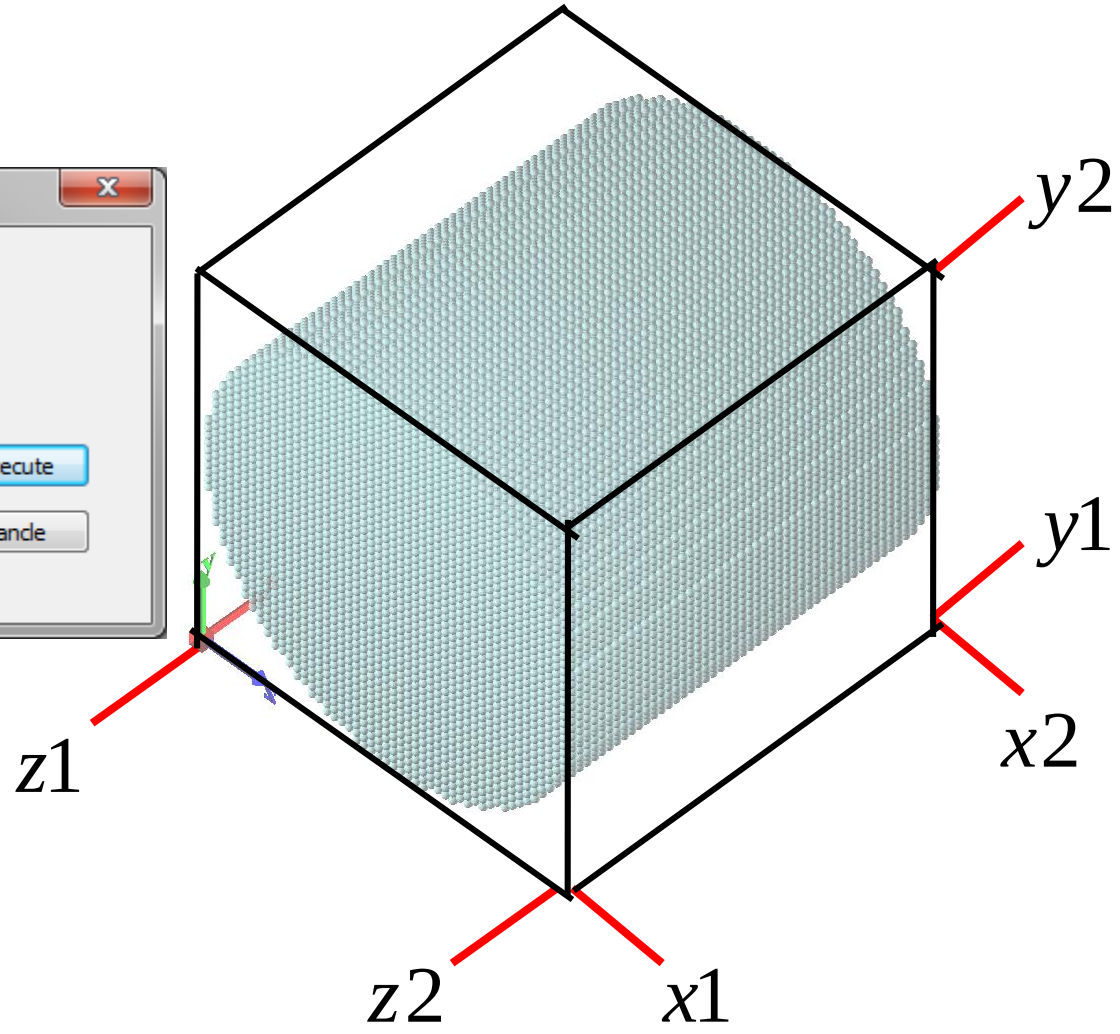




Operation Domain

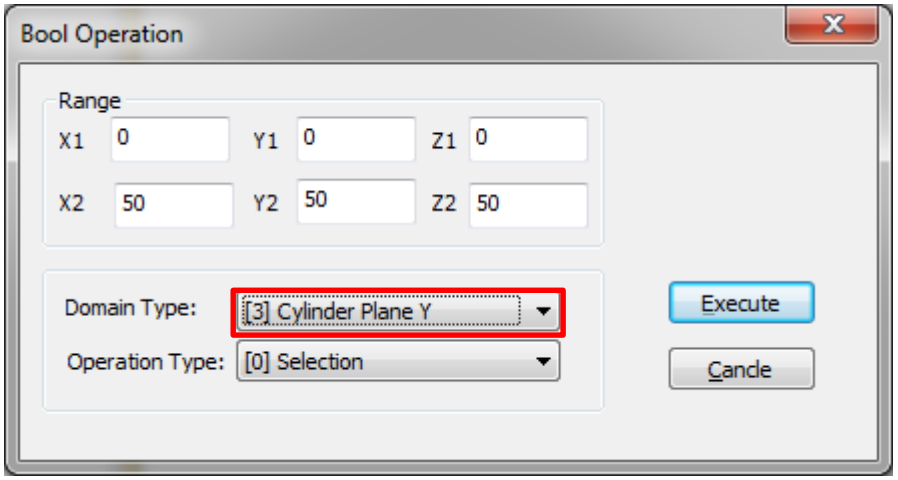
Cylinder Plane X

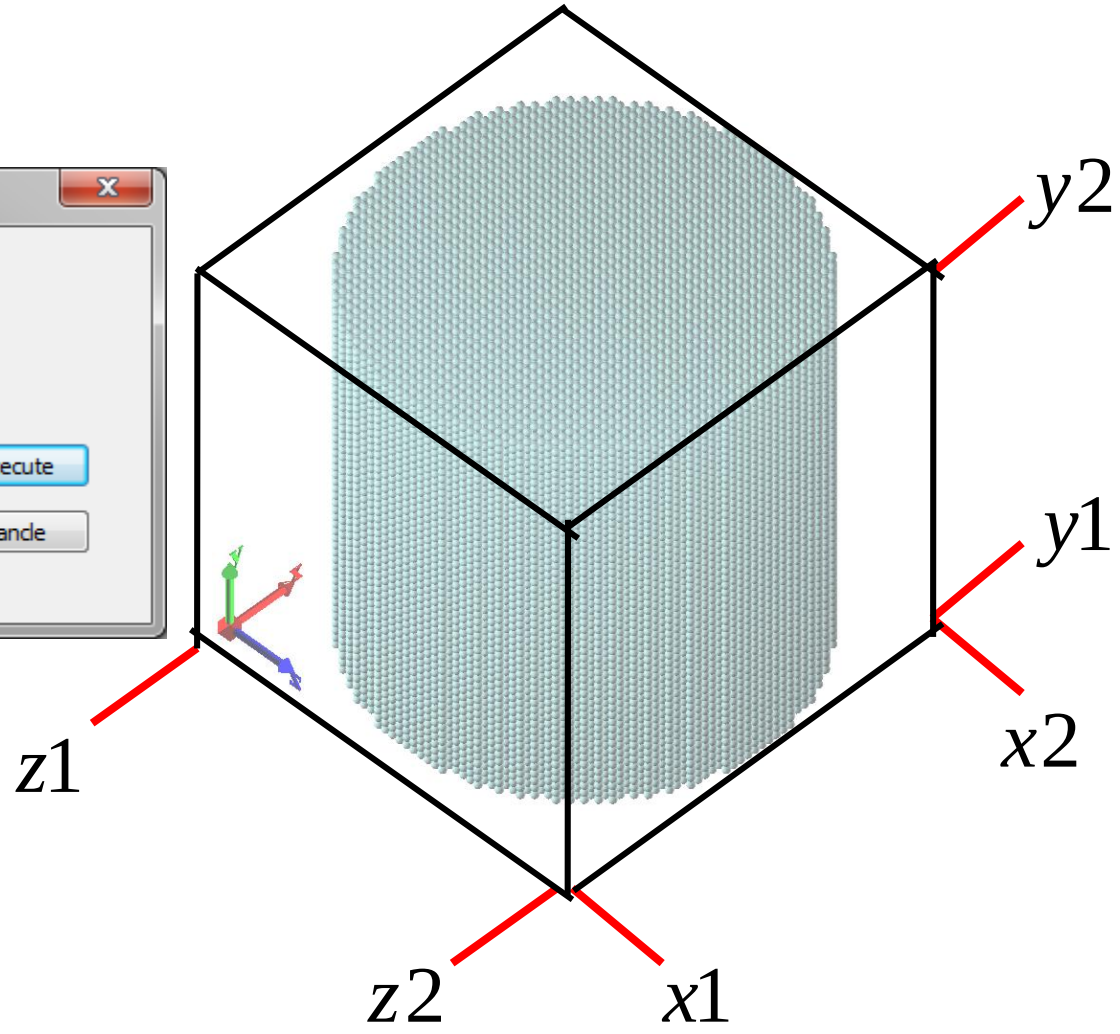




Operation Domain

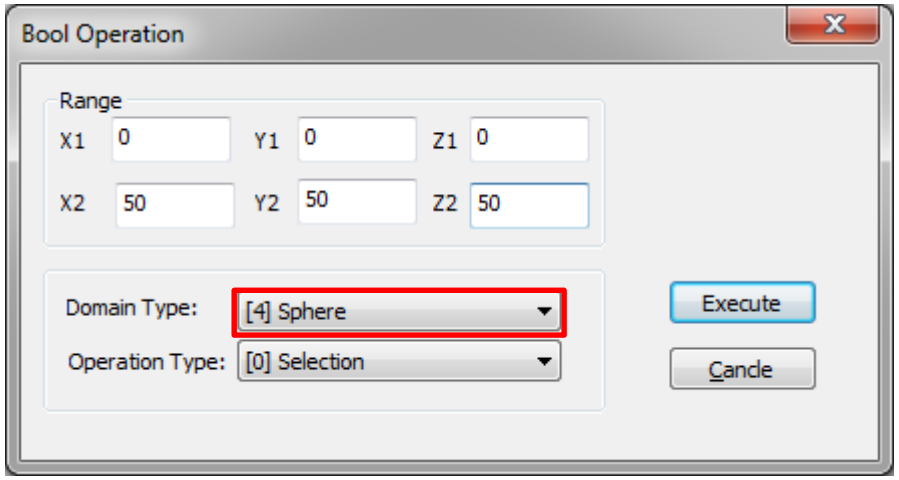
Cylinder Plane Y

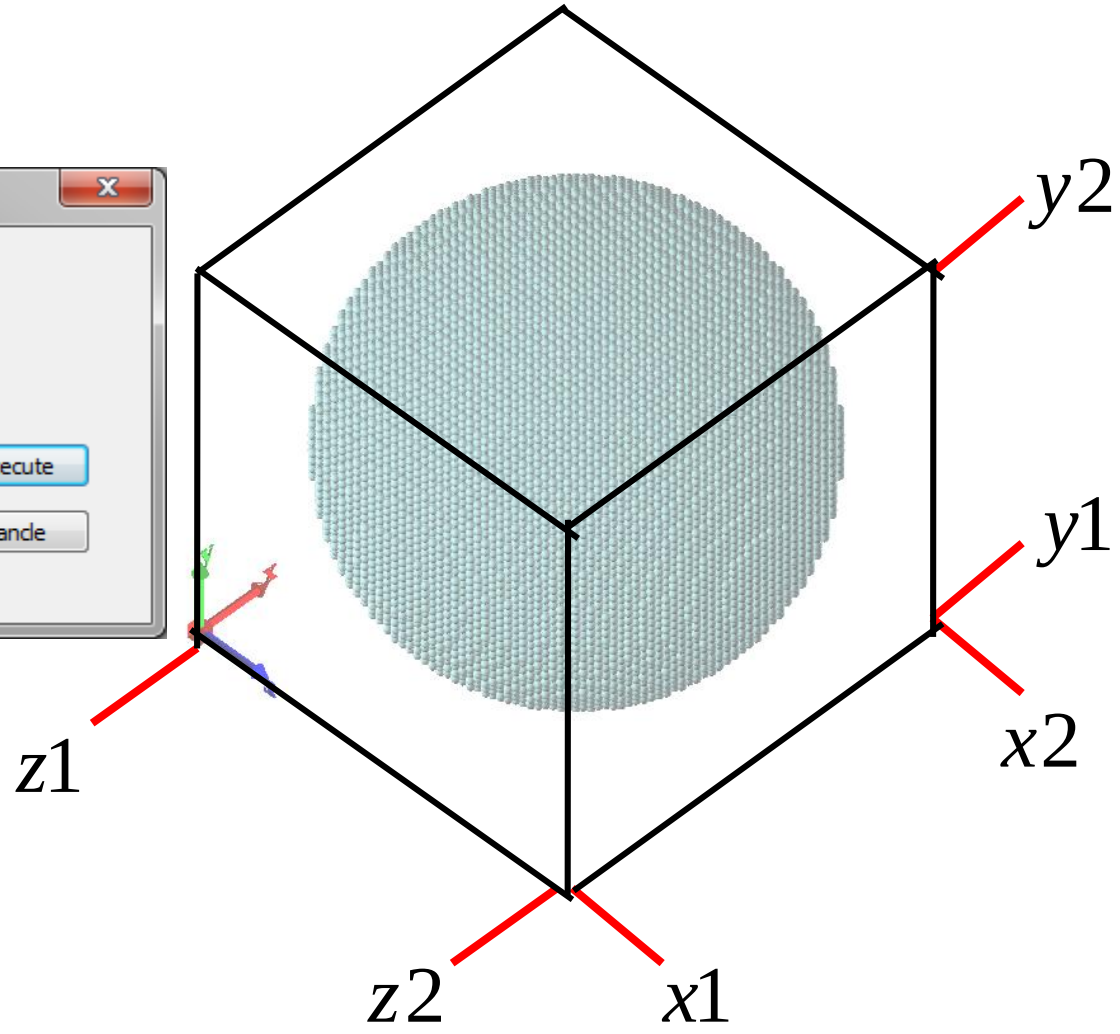




Operation Domain

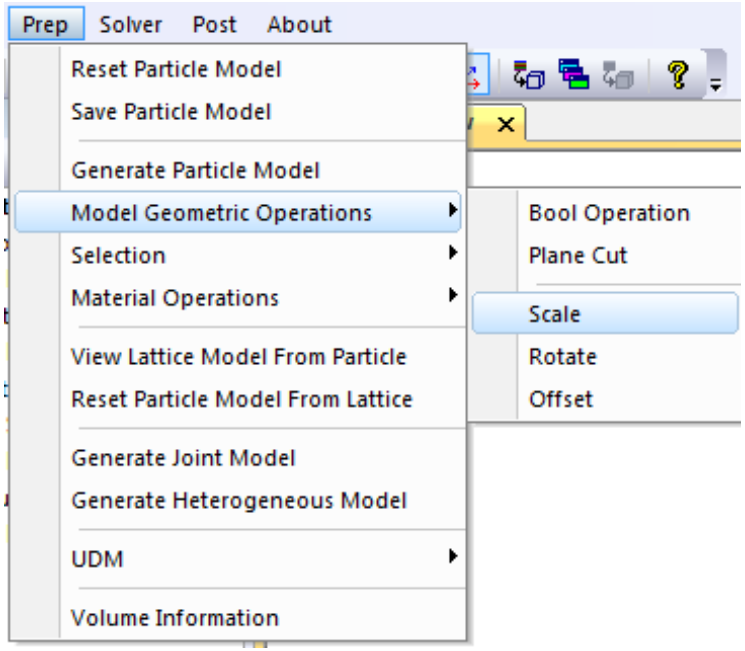
Sphere

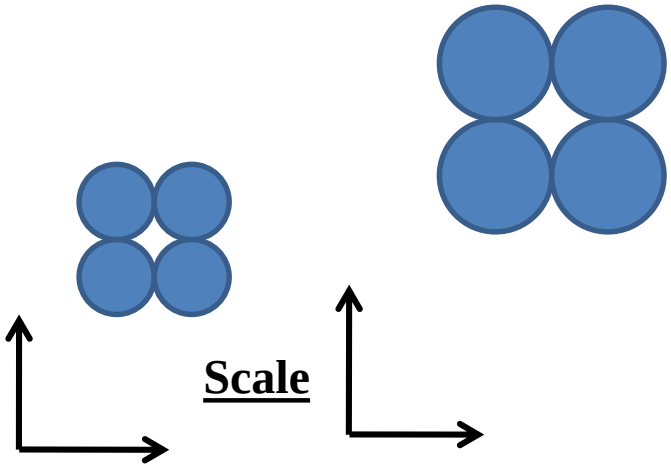


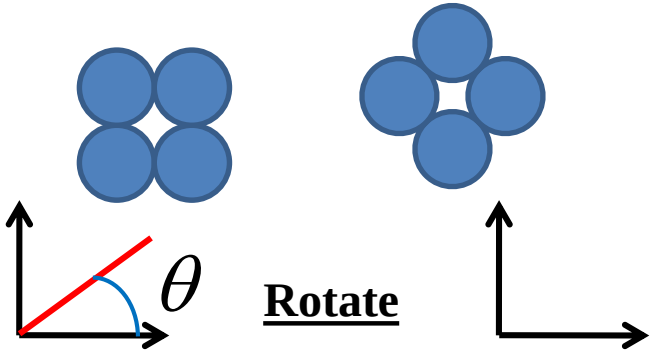


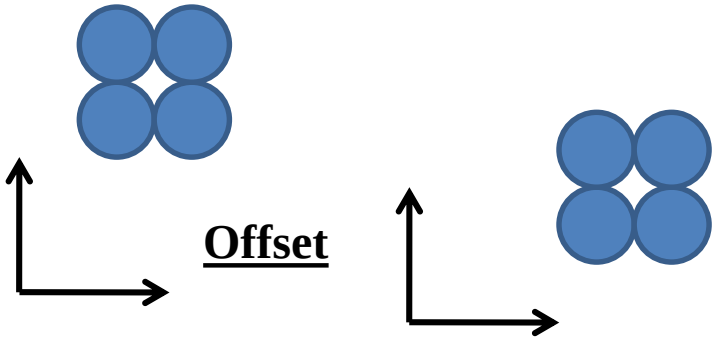
Geometric Operation

Geometric Operation



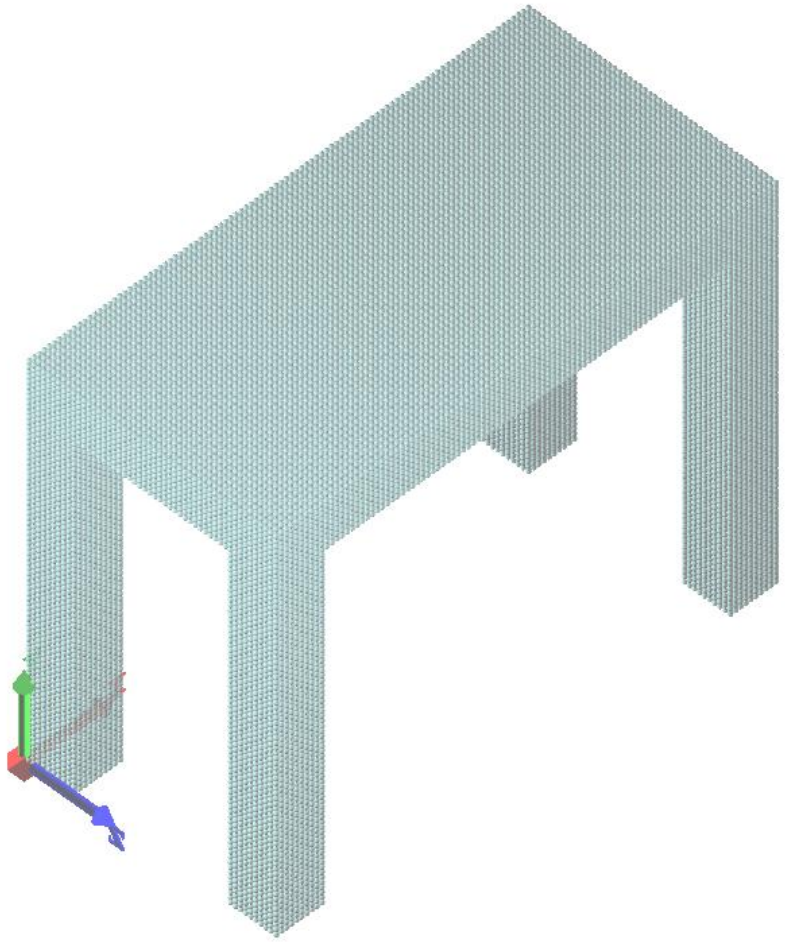






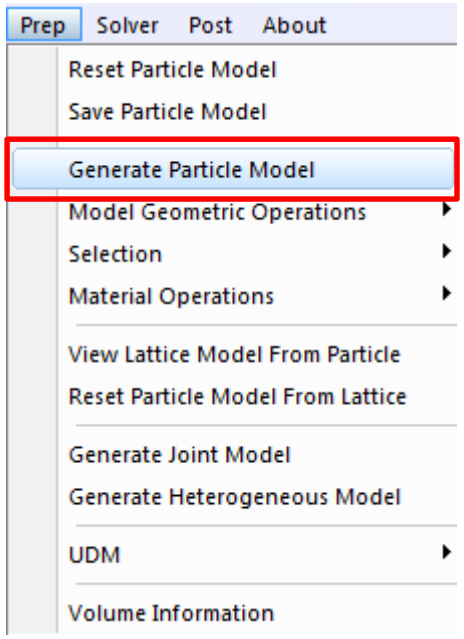
Examples

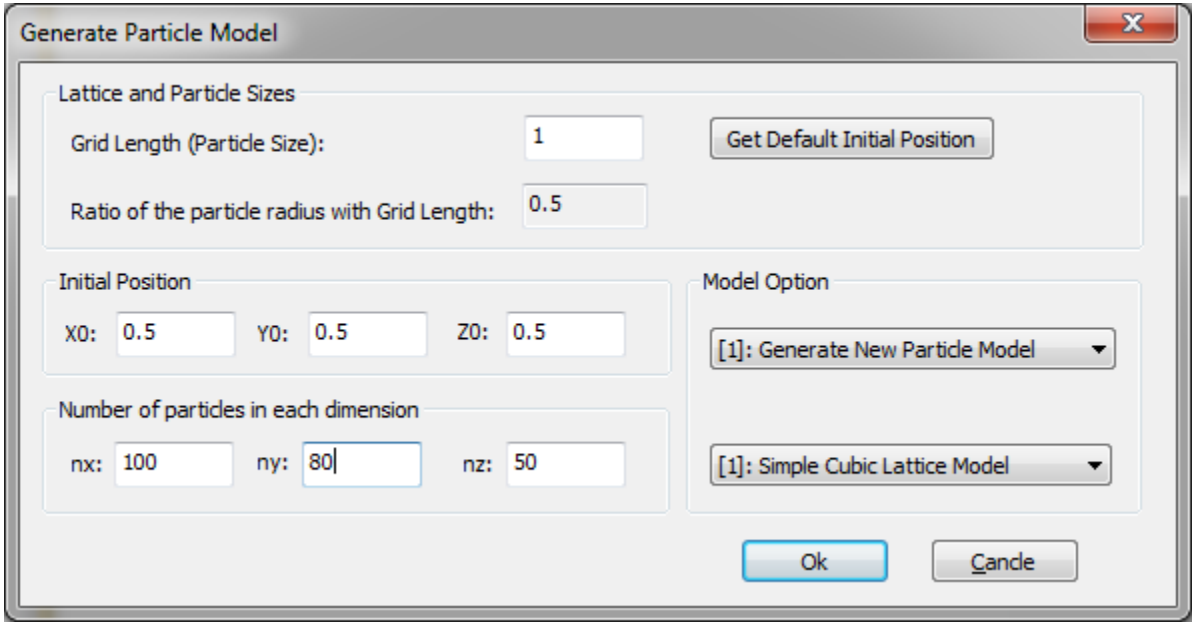
Example 01



Example 01

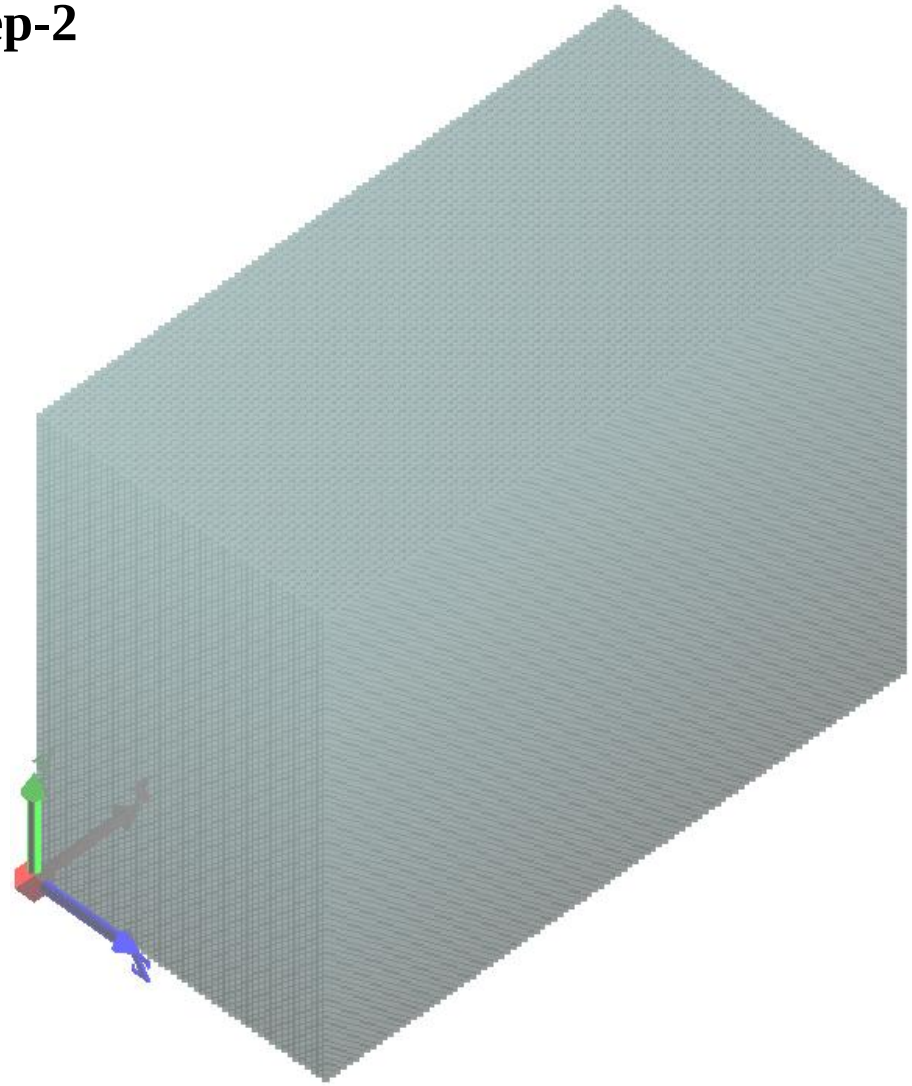
Step-1

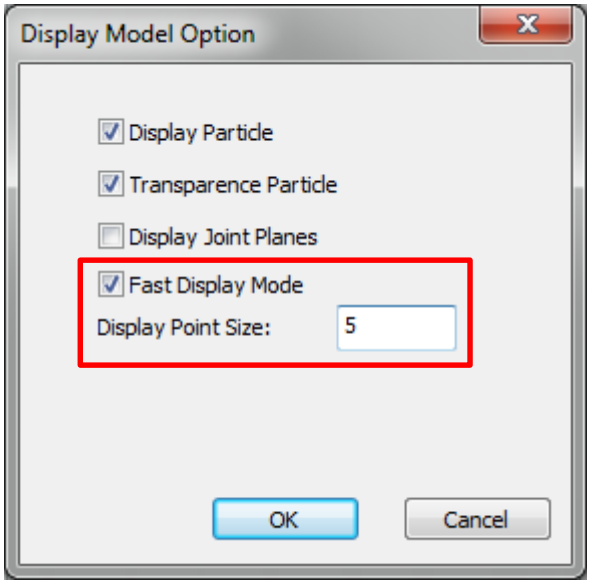




Example 01

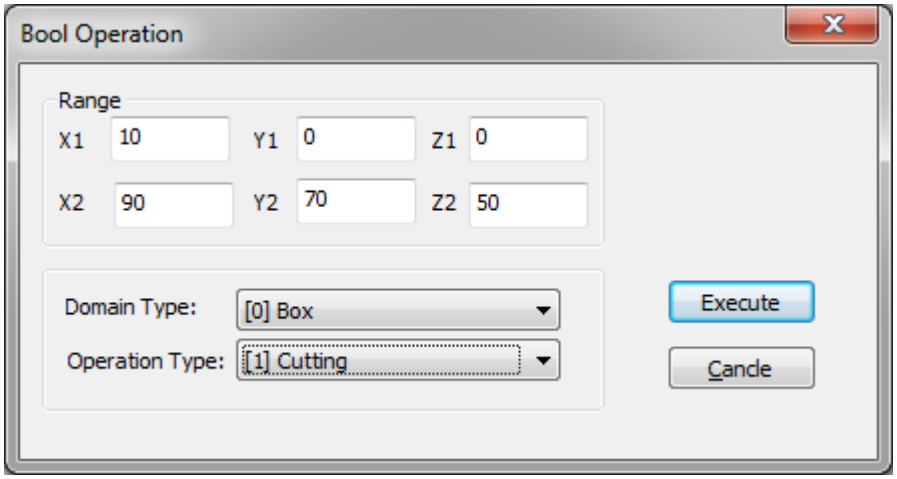
Step-2

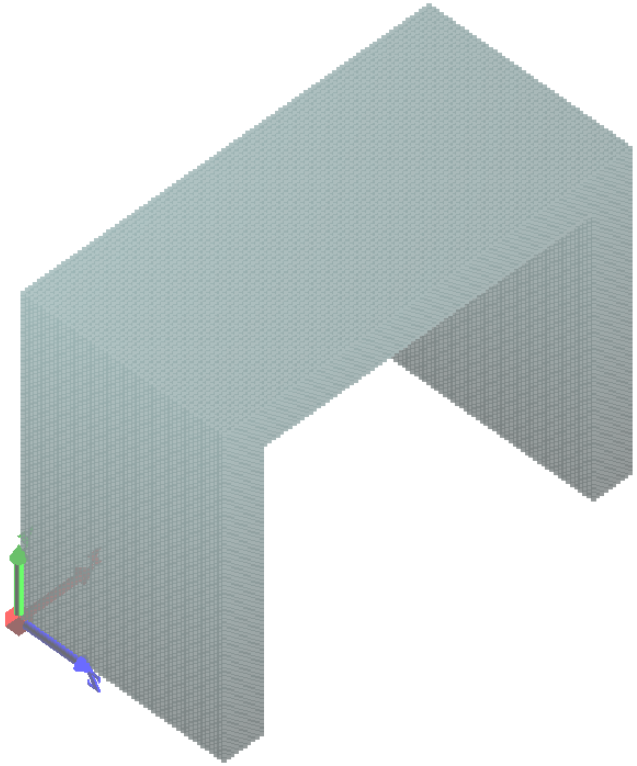




Example 01

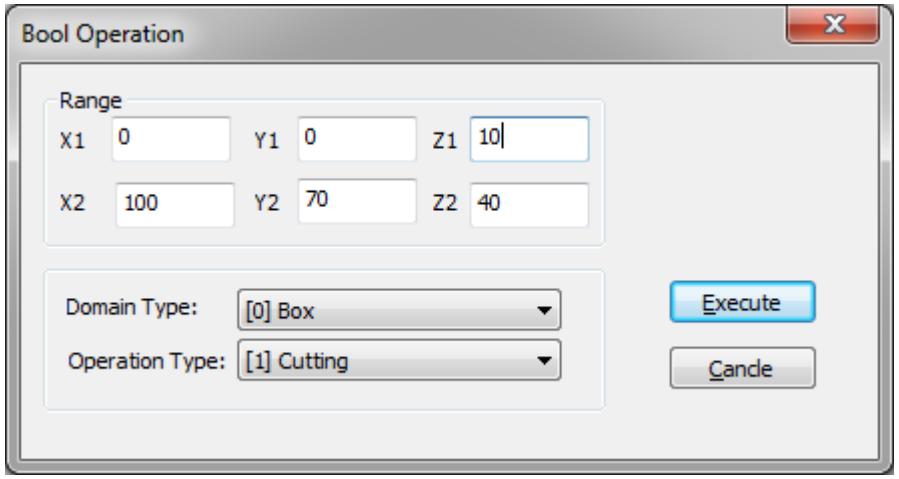
Step-3

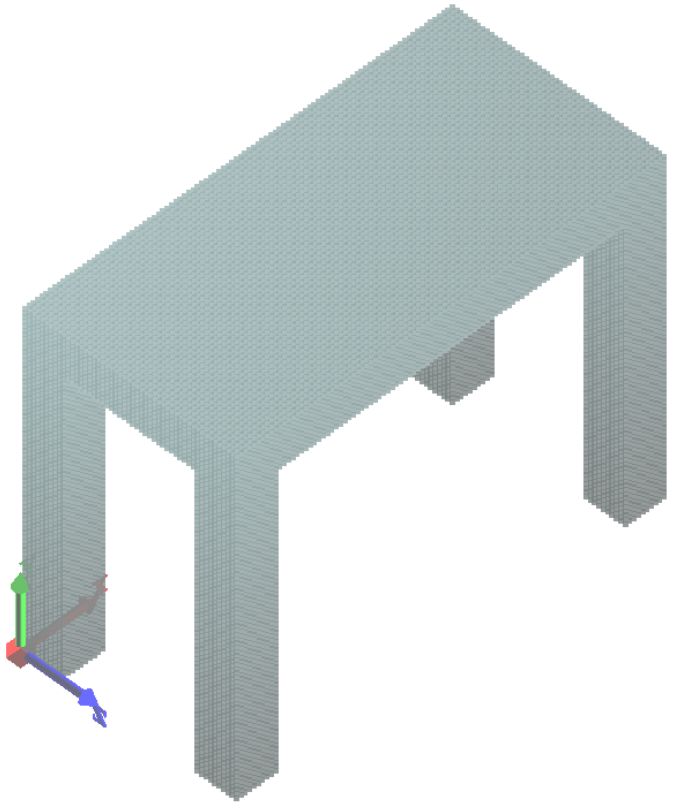




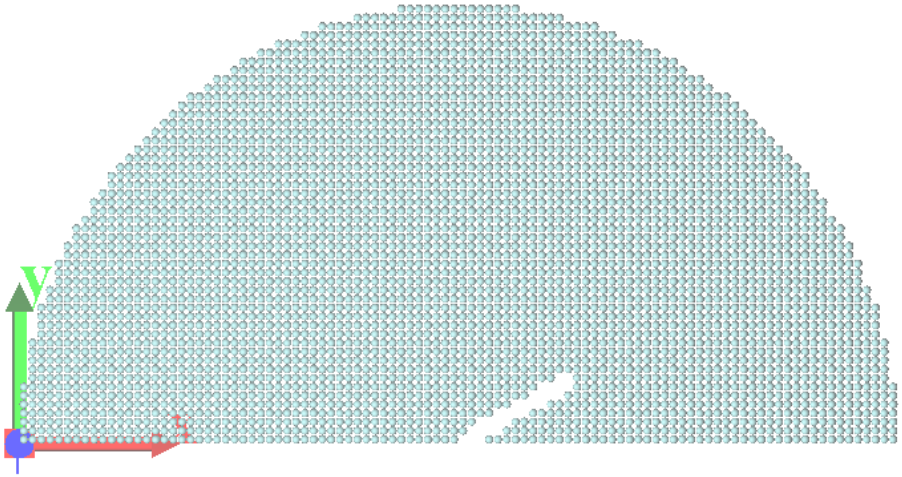
Example 01

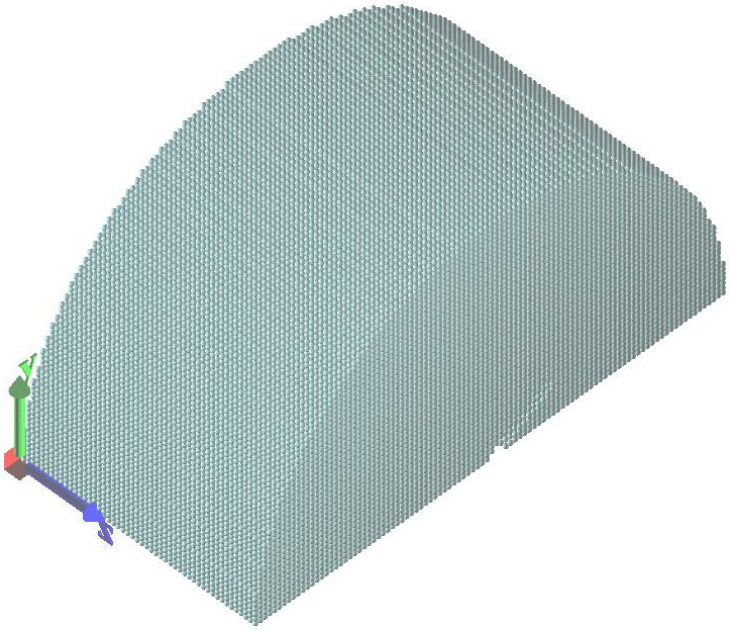
Step-4





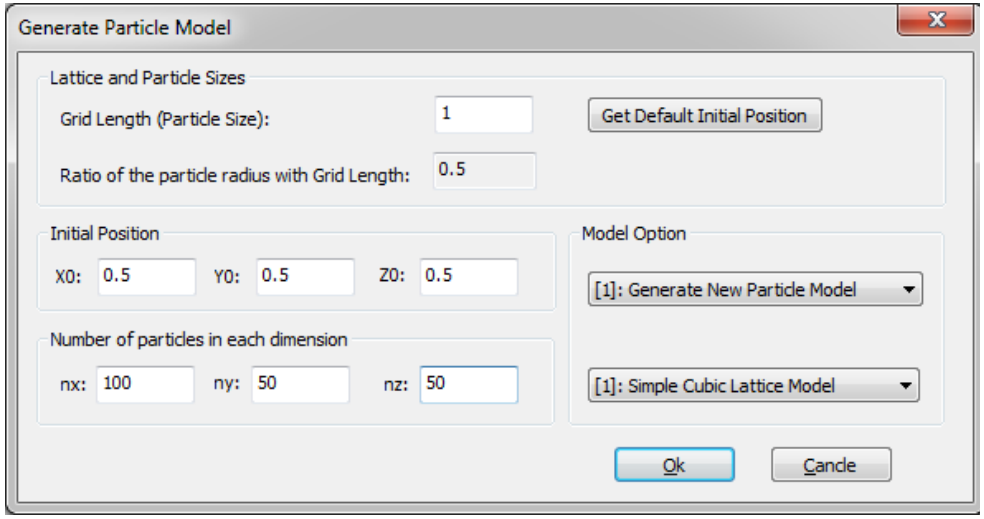
Example 02

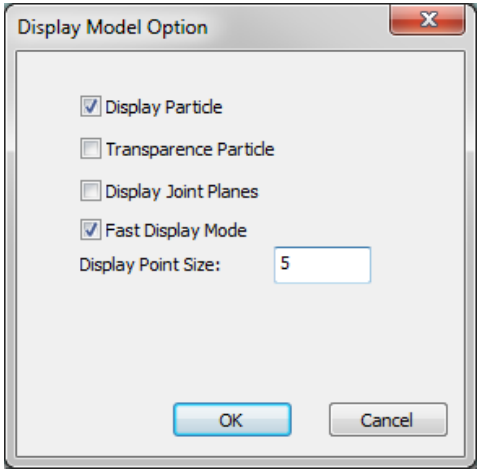


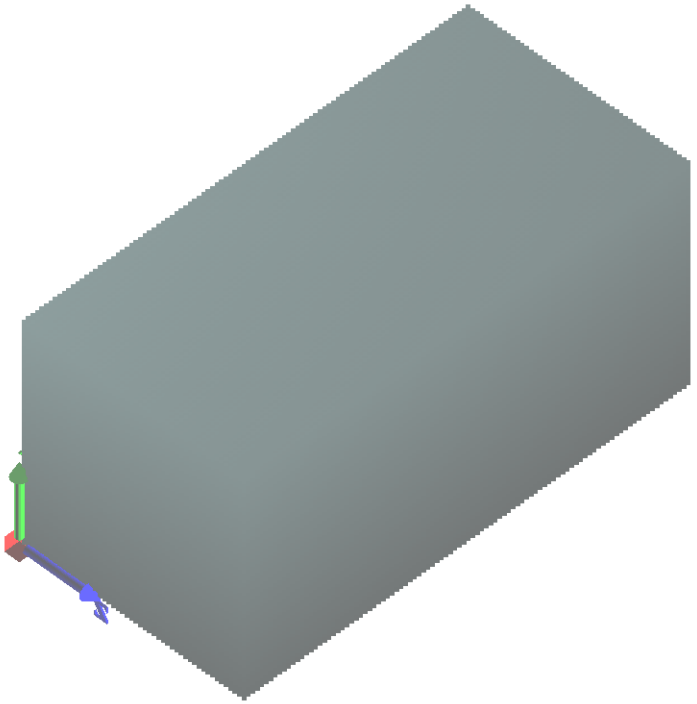


Example 02

Step-1

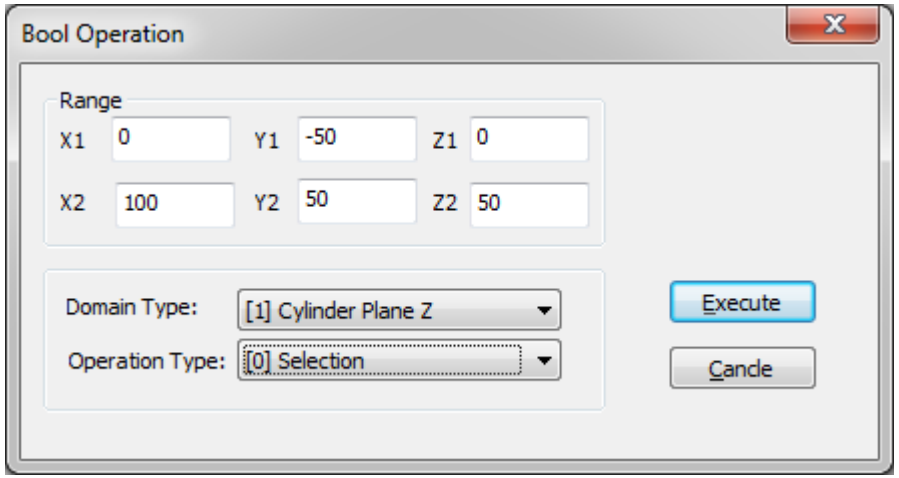


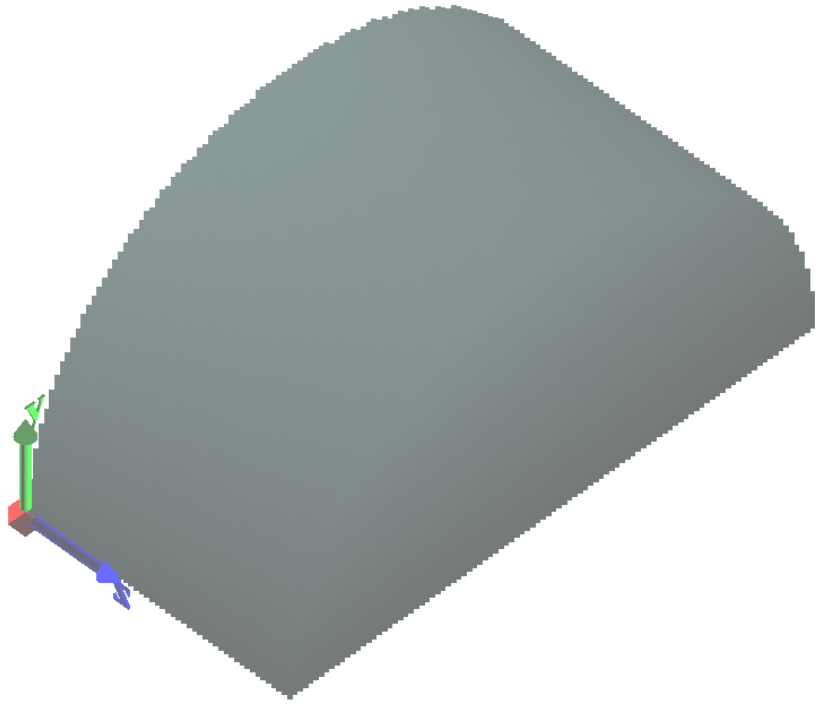




Example 02

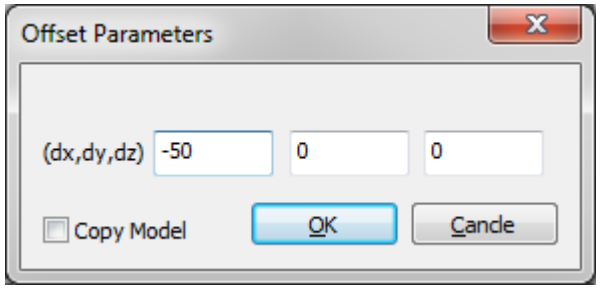
Step-2

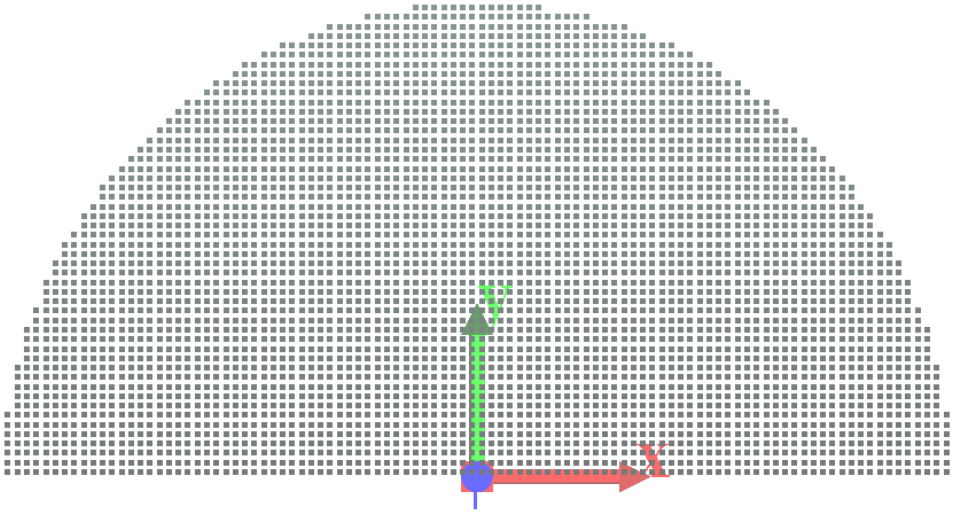




Example 02

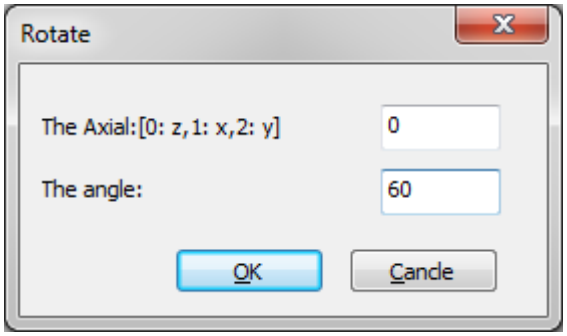
Step-3

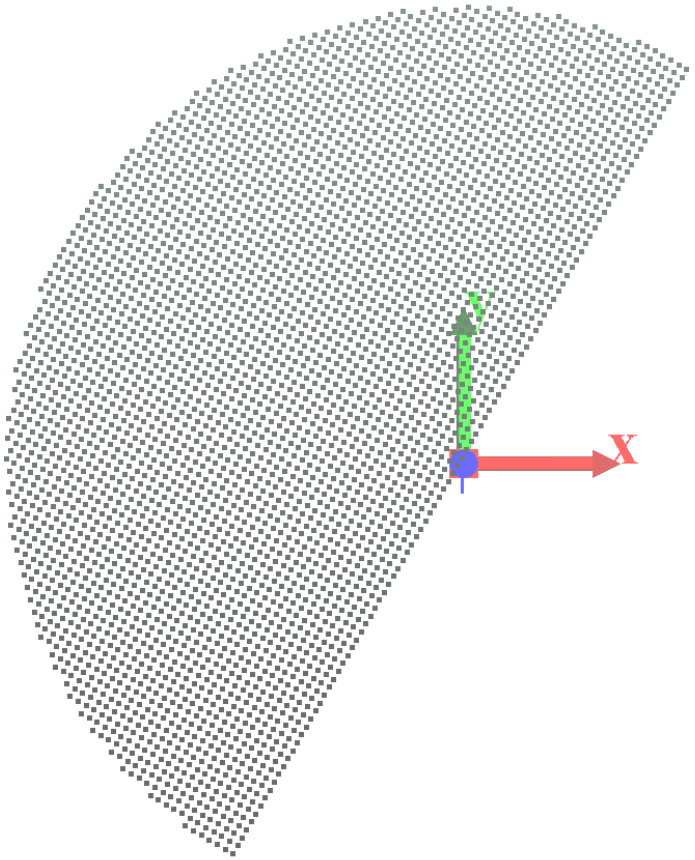




Example 02

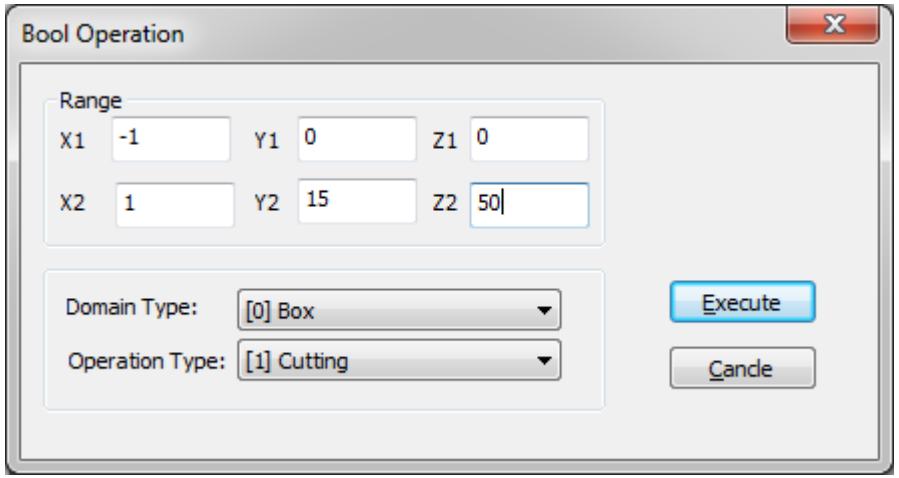
Step-4

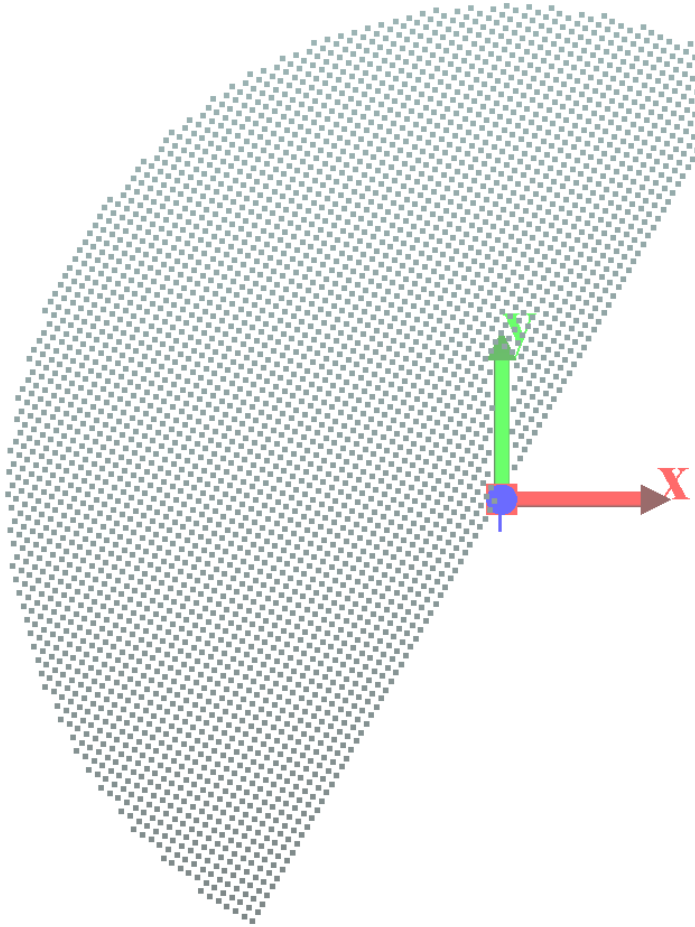




Example 02

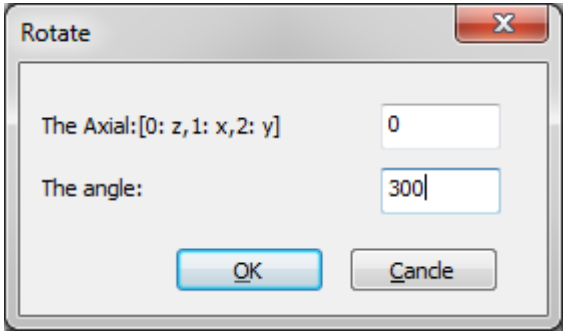
Step-5

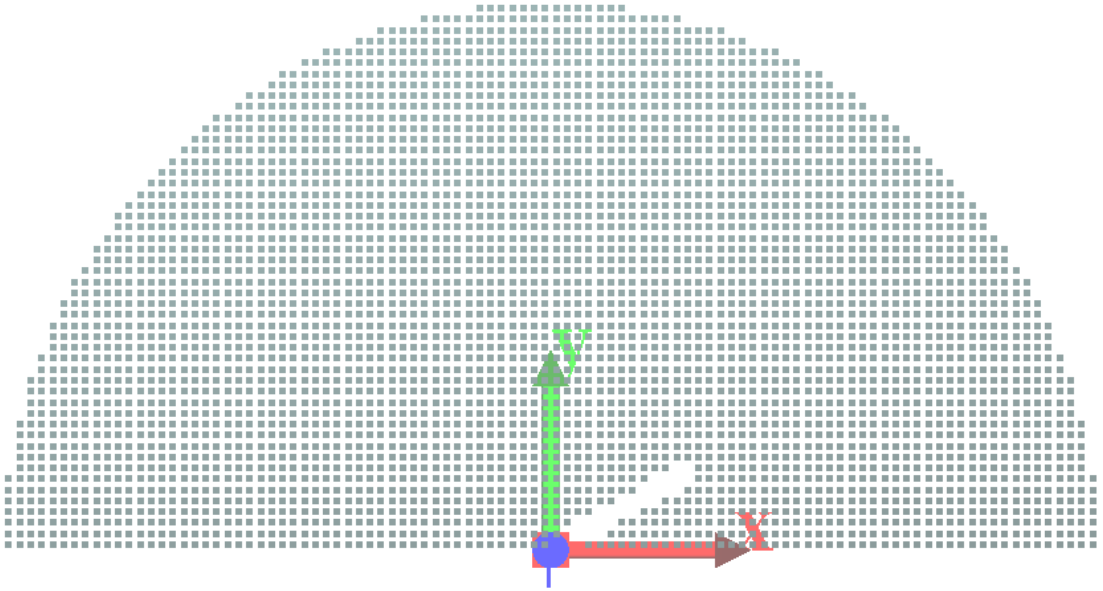




Example 02

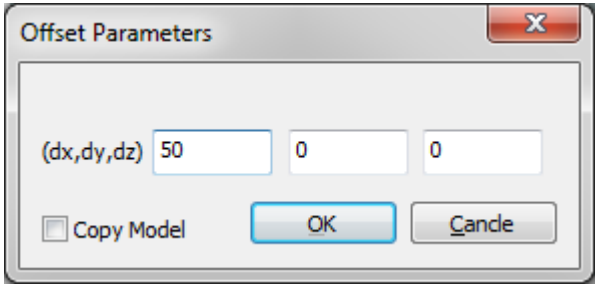
Step-6

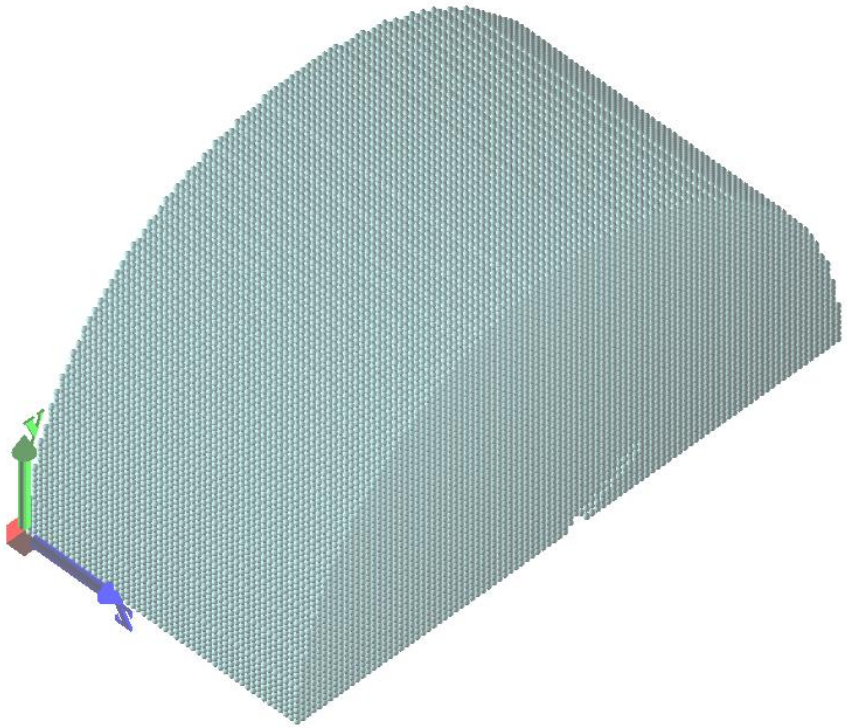




Example 02

Step-7





If you can't explain it simply,
you don't understand it well enough.-Albert Einstein

TO BE CONTINUED…

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