

Swiftcomp2.1.0-MVT-Trial-Report

MVT Version: 1.0

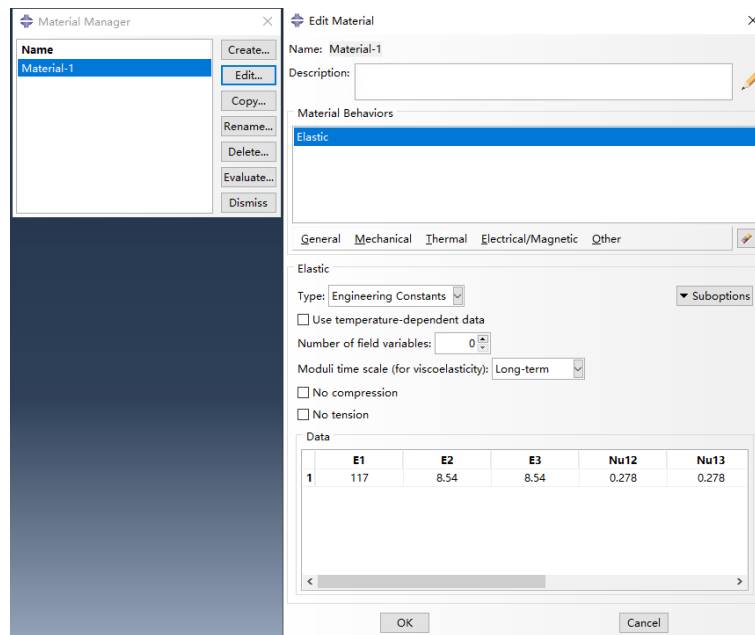
Abaqus-SwiftComp-GUI and Gmsh4SC user's manual are referred to carry out test examples.

In general, all tests have difficulty in dehomogenization analysis with detail below.

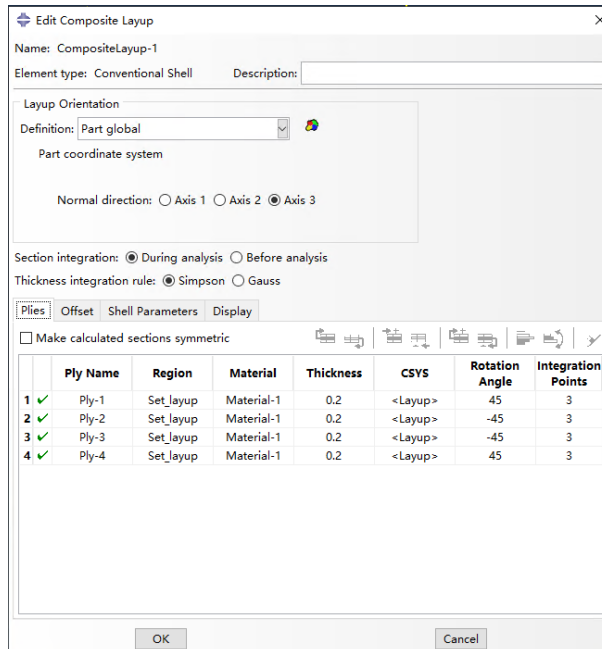
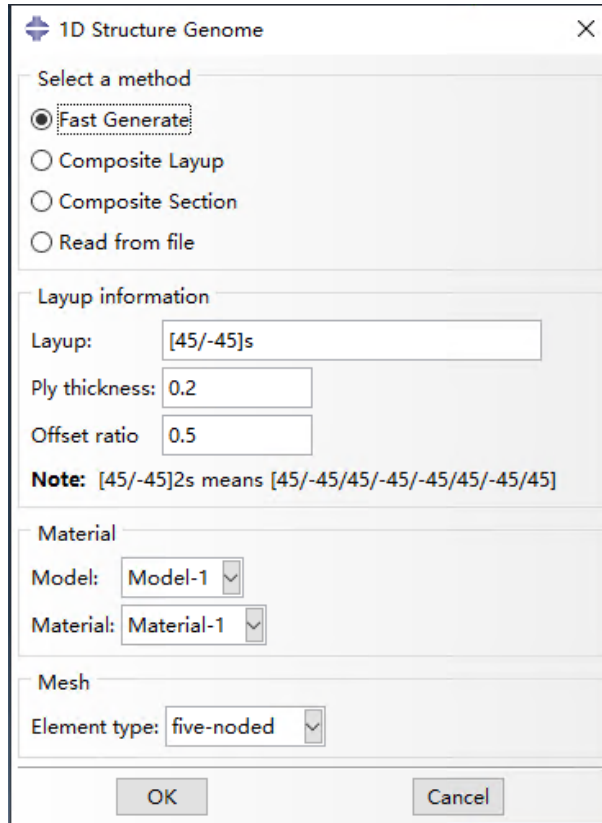
Abaqus-SwiftComp-GUI Version 6.16-0

Laminate (1D SG)

Step 1 : Create materials



Step 2 : Create geometry and mesh of 1D SG



Step 3 : Homogenization

Homogenization

New SwiftComp file name: []

Model source
 CAE Input file
 Model: Model-1 Part: Laminate

Macroscopic model
 Dimension: 1D (Beam) 2D (Shell) 3D (Solid)
 Dimensionally reducible structures
 Specific model: Classical

Omega: []

Note: Provide omega if the combination of structural model and structure genome is NOT any of the following cases:
 1) 3D solid model with regular structure genome (rectangular for 2D and cuboid for 3D);
 2) 2D shell model with 1D structure genome;
 3) 1D beam model with 2D structure genome.
 Please refer to the SwiftComp manual for more details.

Options
 Analysis type: Elastic
 Element type: Regular
 Elemental orientation: Global
 Temperature distribution: Uniform

Aperiodic
 y1 y2 y3

Viscoelastic/Thermoviscoelastic Analysis
 Initial time: []
 Final time: []
 Time increment (decades): []

Note: Provide a time increment in decades for the desired effective properties. Only valid for viscoelastic and thermoviscoelastic cases.

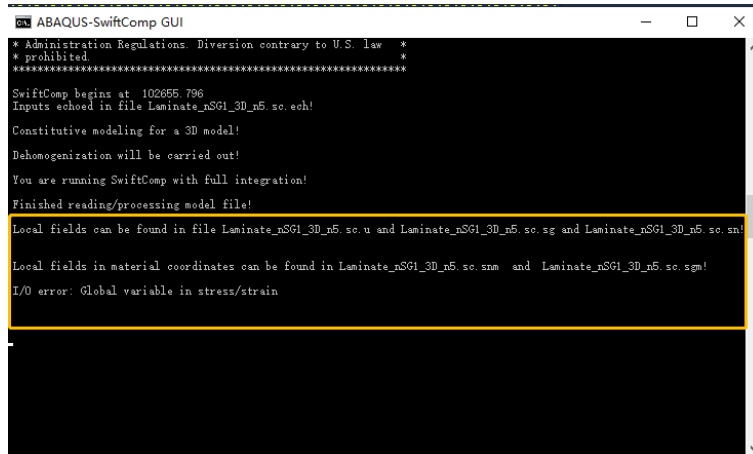
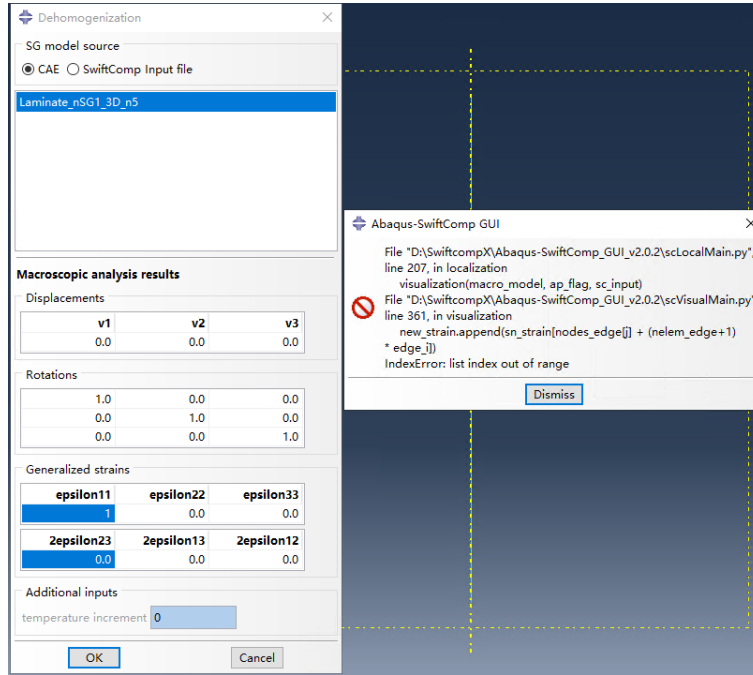
Only generate input file. Do not run SwiftComp.

OK Cancel

```

Laminat_001_3D_v6.sc.k13
1 The Effective Stiffness Matrix
2 -----
3 3.9150122E+001 3.1350122E+001 5.3741674E+000 0.0000000E+000
4 0.0000000E+000 3.3362361E-015 0.0000000E+000 0.0000000E+000
5 3.1350122E+001 3.9150122E+001 5.3741674E+000 0.0000000E+000
6 0.0000000E+000 3.3362361E-015 0.0000000E+000 0.0000000E+000
7 5.3741674E+000 5.3741674E+000 1.1583814E+001 0.0000000E+000
8 0.0000000E+000 -7.0653605E-017 0.0000000E+000 3.2799406E+000
9 4.2662200E-017 0.0000000E+000 0.0000000E+000 4.2662200E-017
10 0.0000000E+000 0.0000000E+000 0.0000000E+000 0.0000000E+000
11 3.2799406E+000 0.0000000E+000 -7.0653605E-017 0.0000000E+000
12 3.3362361E-015 3.3362361E-015 0.0000000E+000 0.0000000E+000
13 0.0000000E+000 3.0369255E+001 0.0000000E+000 0.0000000E+000
14 -----
15 The Effective Compliance Matrix
16 -----
17 7.1734557E-002 -5.6470571E-002 -7.0815376E-003 0.0000000E+000
18 0.0000000E+000 -1.6933111E-018 -7.0815376E-003 0.0000000E+000
19 -5.6470571E-002 7.1734557E-002 -1.6933111E-018 0.0000000E+000
20 0.0000000E+000 -1.6933111E-018 9.289135E-002 0.0000000E+000
21 -7.0815376E-003 -7.0815376E-003 9.289135E-002 0.0000000E+000
22 0.0000000E+000 1.7720208E-018 0.0000000E+000 3.0488357E-001
23 -3.9656218E-018 -0.0000000E+000 0.0000000E+000 -3.9656218E-018
24 0.0000000E+000 0.0000000E+000 0.0000000E+000 0.0000000E+000
25 3.0488357E-001 -0.0000000E+000 1.7720208E-018 0.0000000E+000
26 -1.6933111E-018 -1.6933111E-018 1.7720208E-018 0.0000000E+000
27 0.0000000E+000 3.2928038E-002 0.0000000E+000 0.0000000E+000
28 -----
29 The Engineering Constants (Approximated as Orthotropic)
30 -----
31 E1 =
32 1.3940283E+001
  
```

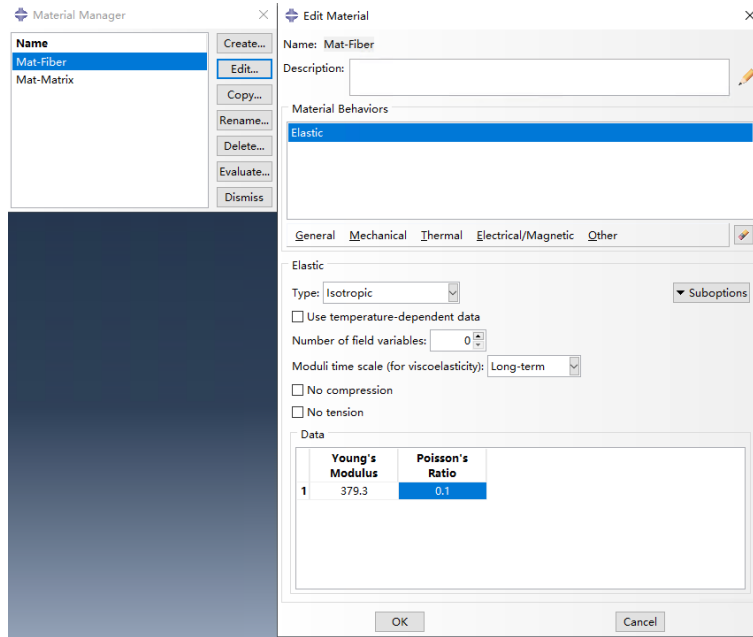
Step 4 : Dehomogenization(Error...No results found)



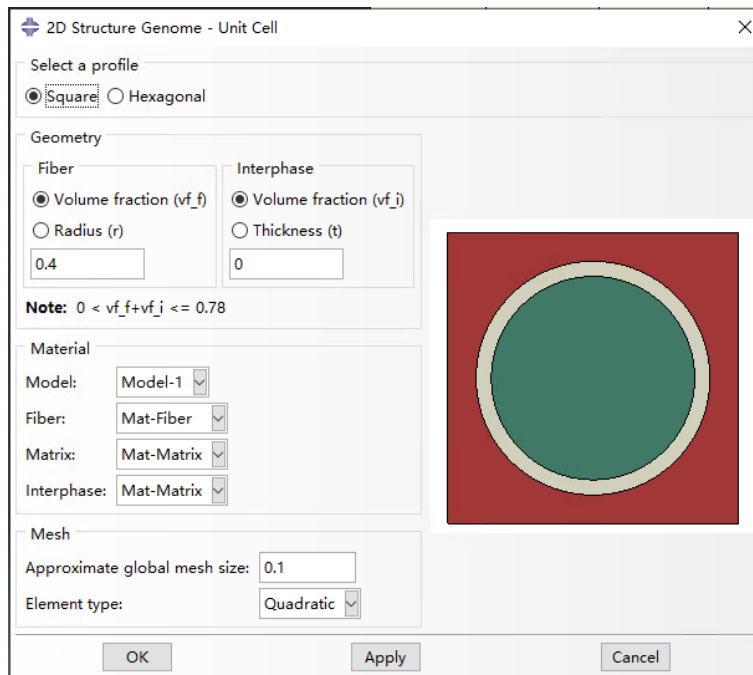
名称	修改日期	类型	大小
Laminate_nSG1_3D_n5.sc.ech	2023/9/6 10:26	ECH 文件	4 KB
Laminate_nSG1_3D_n5.sc.glb	2023/9/6 10:26	GLB 文件	1 KB
Laminate_nSG1_3D_n5.sc.sg	2023/9/6 10:26	SG 文件	0 KB
Laminate_nSG1_3D_n5.sc.sgm	2023/9/6 10:26	SGM 文件	0 KB
Laminate_nSG1_3D_n5.sc.sn	2023/9/6 10:26	SN 文件	0 KB
Laminate_nSG1_3D_n5.sc.snm	2023/9/6 10:26	SNM 文件	0 KB
Laminate_nSG1_3D_n5.sc.u	2023/9/6 10:26	U 文件	0 KB
Laminate_nSG1_3D_n5.sc.k	2023/9/6 10:22	K 文件	5 KB
Laminate_nSG1_3D_n5.sc.opt	2023/9/6 10:22	OPT 文件	3 KB
Laminate_nSG1_3D_n5.sc	2023/9/6 10:22	SC 文件	2 KB

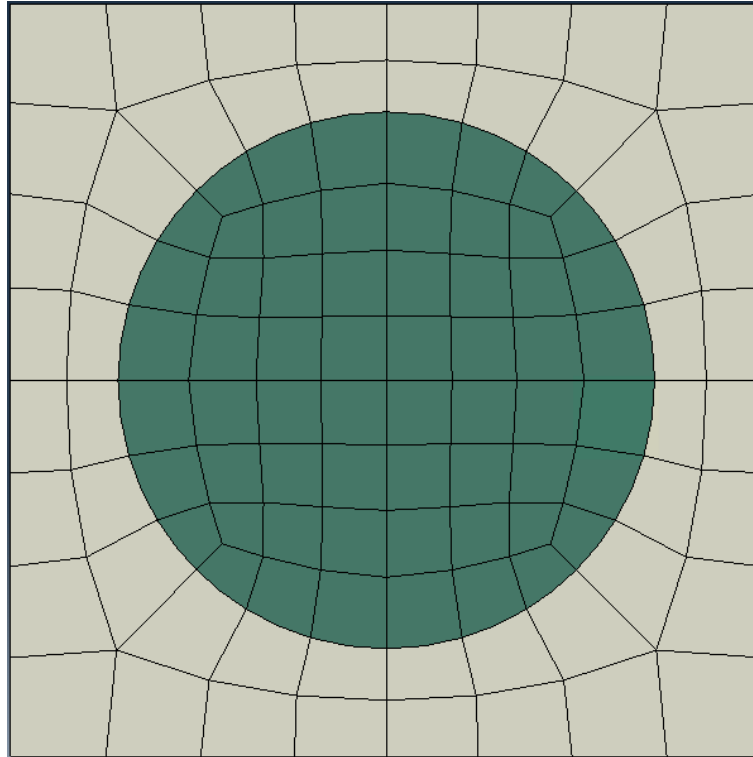
Square Pack Microstructure (2D SG)

Step 1 : Create materials



Step 2 : Create geometry and mesh of 2D SG





Step 3 : Homogenization

Homogenization

New SwiftComp file name: [text box]

Model source
 CAE Input file
Model: Model-1 Part: sqrp2

Macroscopic model
Dimension: 1D (Beam) 2D (Shell) 3D (Solid)
Dimensionally reducible structures
Specific model: Classical

Omega: [text box]

Note: Provide omega if the combination of structural model and structure genome is NOT any of the following cases:
1) 3D solid model with regular structure genome (rectangular for 2D and cuboid for 3D);
2) 2D shell model with 1D structure genome;
3) 1D beam model with 2D structure genome.
Please refer to the SwiftComp manual for more details.

Options
Analysis type: Elastic
Element type: Regular
Elemental orientation: Global
Temperature distribution: Uniform

Aperiodic
 y1 y2 y3

Viscoelastic/Thermoviscoelastic Analysis
Initial time: [text box]
Final time: [text box]
Time increment (decades): [text box]
Note: Provide a time increment in decades for the desired effective properties. Only valid for viscoelastic and thermoviscoelastic cases.

Only generate input file. Do not run SwiftComp.

OK Cancel

```

1  The Effective Stiffness Matrix
2
3  2.1031440E+002    4.0153835E+001    4.0153834E+001    2.1441182E-015
4  0.0000000E+000    0.0000000E+000
5  4.0153835E+001    1.4603056E+002    4.6085753E+001    -2.3314684E-015
6  0.0000000E+000    0.0000000E+000
7  4.0153834E+001    4.6085753E+001    1.4603050E+002    2.9420910E-014
8  0.0000000E+000    0.0000000E+000
9  2.1441182E-015    -2.3314684E-015    2.9420910E-014    4.1711969E+001
10 0.0000000E+000    0.0000000E+000
11 0.0000000E+000    0.0000000E+000    0.0000000E+000    0.0000000E+000
12 4.8305118E+001    2.8699265E-014    0.0000000E+000    0.0000000E+000
13 0.0000000E+000    4.8305135E+001
14
15 The Effective Compliance Matrix
16
17 5.1671721E-003    -1.0799798E-003    -1.0799805E-003    4.3577520E-019
18 0.0000000E+000    -0.0000000E+000
19 -1.0799798E-003    7.8310757E-003    -2.1744478E-003    2.0269420E-018
20 0.0000000E+000    -0.0000000E+000
21 -1.0799805E-003    -2.1744478E-003    7.8310793E-003    -5.5895594E-018
22 0.0000000E+000    -0.0000000E+000
23 4.3577520E-019    2.0269420E-018    -5.5895594E-018    2.3973934E-002
24 0.0000000E+000    -0.0000000E+000
25 0.0000000E+000    0.0000000E+000    0.0000000E+000    0.0000000E+000
26 2.0701740E-002    -1.2299412E-017    0.0000000E+000    0.0000000E+000
27 0.0000000E+000    0.0000000E+000    0.0000000E+000    0.0000000E+000
28 -1.2299412E-017    2.0701733E-002
29
30 The Engineering Constants (Approximated as Orthotropic)
31
32 E1 =
33 1.9352945E+002

```

Step 4 : Dehomogenization(Error...No results found)

```

ABAQUS-SwiftComp GUI
* These commodities, technology or software were exported from *
* the United States in accordance with the Export *
* Administration Regulations. Diversion contrary to U.S. law *
* prohibited. *
*****
SwiftComp begins at 110502.879
Inputs echoed in file sqrP2_nSG2_3D_S8Rpbc.sc.ech!
Constitutive modeling for a 3D model!
Dehomogenization will be carried out!
You are running SwiftComp with full integration!
Finished reading/processing model file!
Local fields can be found in file sqrP2_nSG2_3D_S8Rpbc.sc.u and sqrP2_nSG2_3D_S8Rpbc.sc.sg and sqrP2_nSG2_3D_S8Rpbc.sc.sn
I/O error: Global variable in stress/strain

```

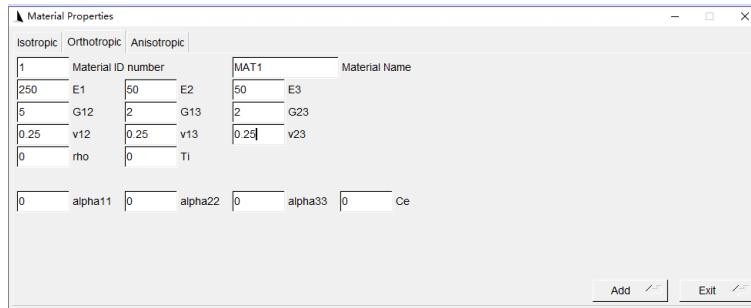
sqrP2_nSG2_3D_S8Rpbclck	2023/9/6 11:05	LCK 文件	0 KB
sqrP2_nSG2_3D_S8Rpbcoodb	2023/9/6 11:05	ODB 文件	133 KB
sqrP2_nSG2_3D_S8Rpbcscech	2023/9/6 11:05	ECH 文件	35 KB
sqrP2_nSG2_3D_S8Rpbcsclb	2023/9/6 11:05	GLB 文件	1 KB
sqrP2_nSG2_3D_S8Rpbcssg	2023/9/6 11:05	SG 文件	0 KB
sqrP2_nSG2_3D_S8Rpbcssn	2023/9/6 11:05	SN 文件	0 KB
sqrP2_nSG2_3D_S8Rpbcssu	2023/9/6 11:05	U 文件	0 KB
sqrP2_nSG2_3D_S8Rpbcssk	2023/9/6 11:03	K 文件	5 KB
sqrP2_nSG2_3D_S8Rpbcssopt	2023/9/6 11:03	OPT 文件	48 KB
sqrP2_nSG2_3D_S8Rpbcssc	2023/9/6 11:03	SC 文件	29 KB

Reference: *Abaqus-SwiftComp_GUI_v1.2.2_Manual.Pdf*

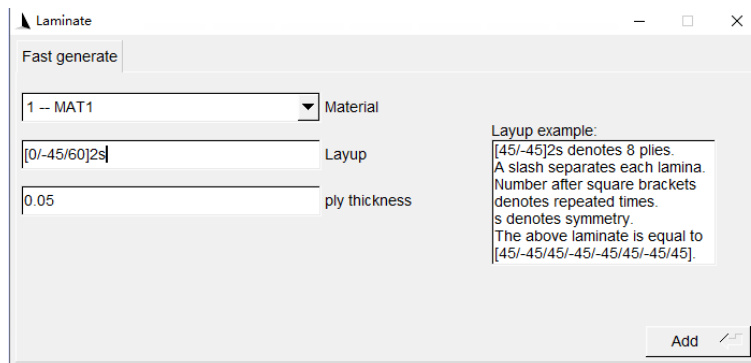
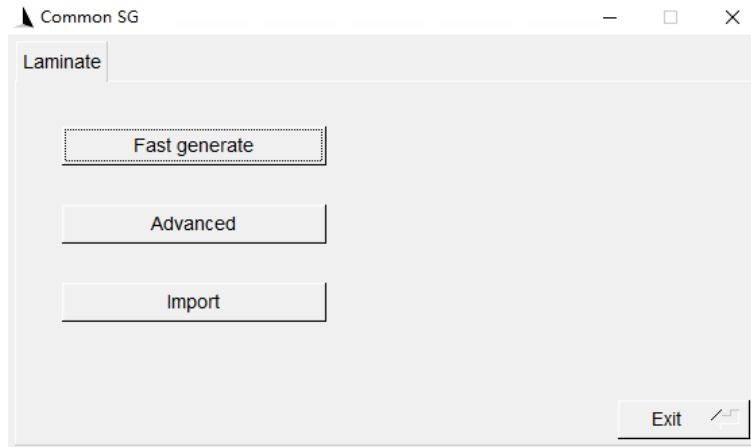
Gmsh4SC USER'S MANUAL March, 2017

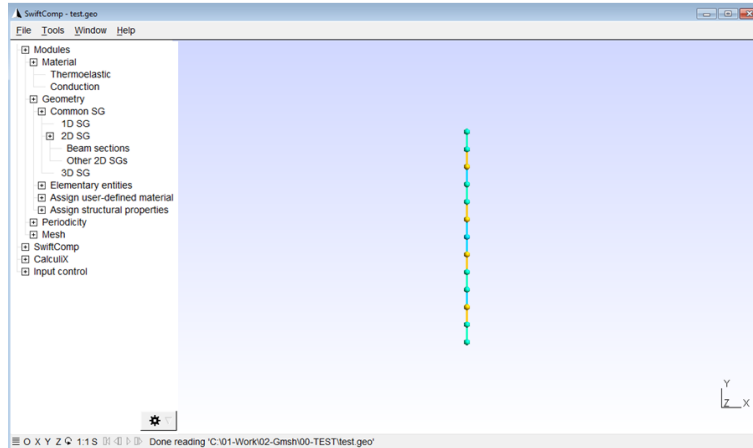
Laminate (1D SG)

Step 1 : Create materials

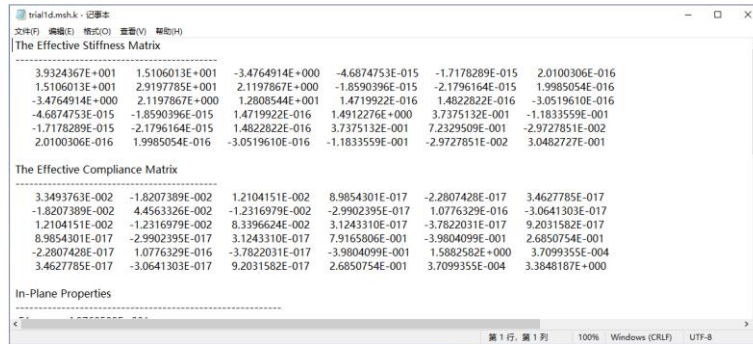
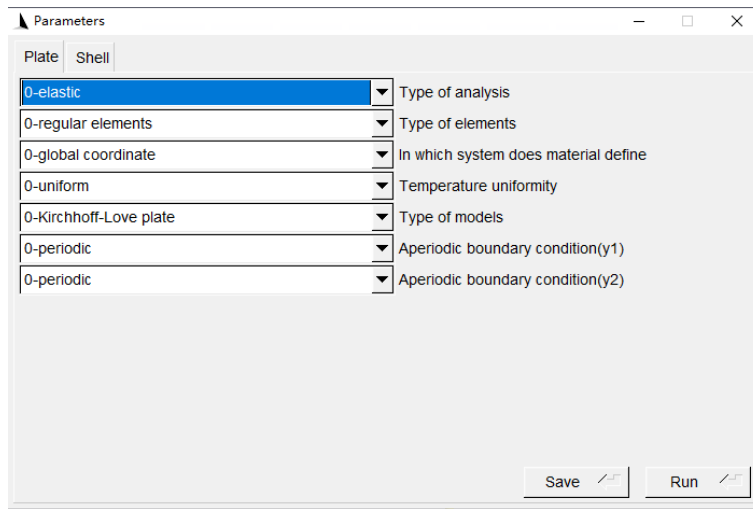


Step 2 : Create geometry and mesh of 1D SG

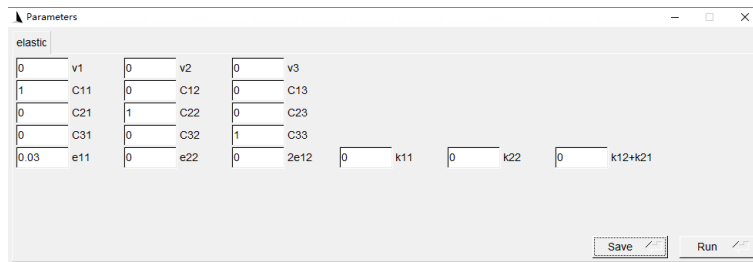




Step 3 : Homogenization



Step 4 : Dehomogenization(Error...No results found)

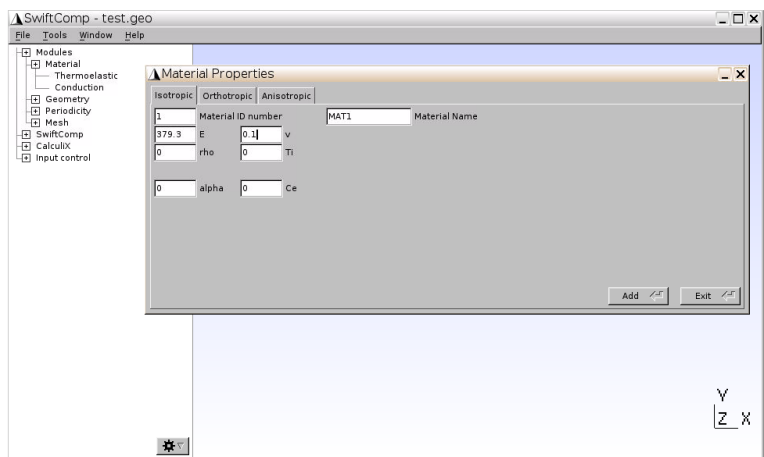


```
SwiftComp begins at 124117.548
Inputs echoed in file D:\SwiftcompX\swiftcomp2.1.0_win\workdir\trial1d.msh.ech!
Constitutive modeling for a 2D (plate/shell) model!
Dehomogenization will be carried out!
You are running SwiftComp with full integration!
Finished reading/processing model file!
Local fields can be found in file D:\SwiftcompX\swiftcomp2.1.0_win\workdir\trial1d.msh.u and D:\SwiftcompX\swiftcomp2.1.0_win\workdir\trial1d.msh.sg and D:\SwiftcompX\swiftcomp2.1.0_win\workdir\trial1d.msh.sn!
Local fields in material coordinates can be found in D:\SwiftcompX\swiftcomp2.1.0_win\workdir\trial1d.msh.snm and D:\SwiftcompX\swiftcomp2.1.0_win\workdir\trial1d.msh.sgm!
I/O error: Global variable in stress/strain
```

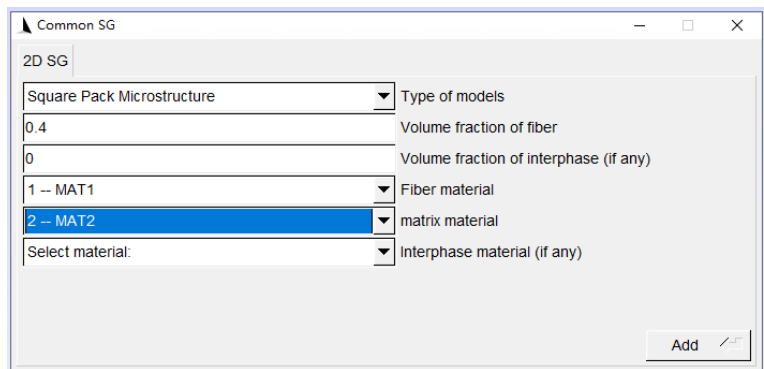
File Name	Date	Time	File Type	Size
trial1dVIEW.geo	2023/9/6	12:42	GEO 文件	1 KB
trial1dVIEW.msh	2023/9/6	12:42	MSH 文件	3 KB
trial1d.msh.ech	2023/9/6	12:41	ECH 文件	6 KB
trial1d.msh.sg	2023/9/6	12:41	SG 文件	0 KB
trial1d.msh.sgm	2023/9/6	12:41	SGM 文件	0 KB
trial1d.msh.sn	2023/9/6	12:41	SN 文件	0 KB
trial1d.msh.snm	2023/9/6	12:41	SNM 文件	0 KB
trial1d.msh.u	2023/9/6	12:41	U 文件	0 KB
trial1d.msh.glb	2023/9/6	12:40	GLB 文件	1 KB
trial1d.msh.opt	2023/9/6	12:39	OPT 文件	8 KB
trial1d.msh	2023/9/6	12:39	MSH 文件	2 KB
trial1d.geo.t	2023/9/6	12:39	T 文件	1 KB
trial1d.geo	2023/9/6	12:39	GEO 文件	2 KB
trial1d.geo.msh	2023/9/6	12:39	MSH 文件	1 KB
trial1d.geo.t3	2023/9/6	12:39	T3 文件	1 KB
trial1d.geo.t2	2023/9/6	12:35	T2 文件	1 KB

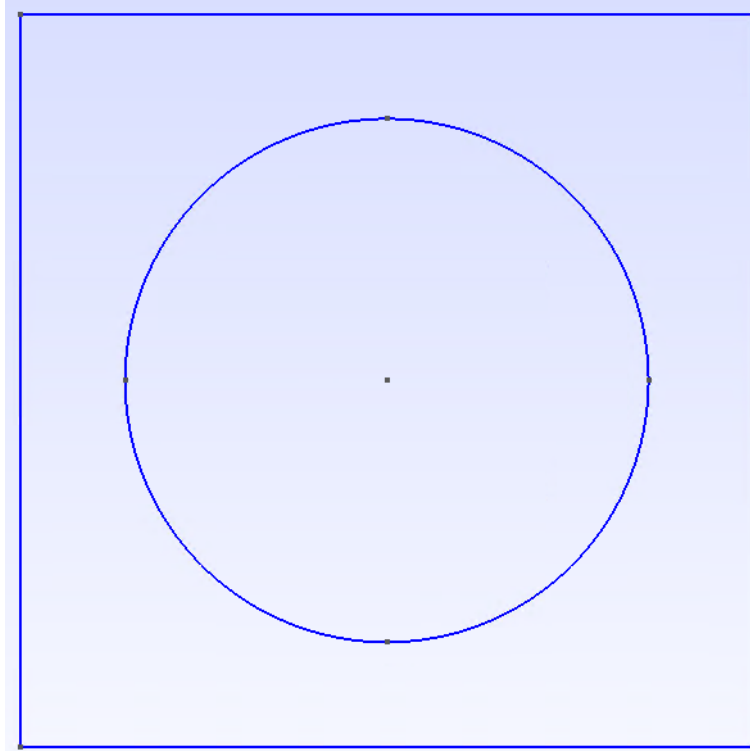
Square Pack Microstructure (2D SG)

Step 1 : Create materials

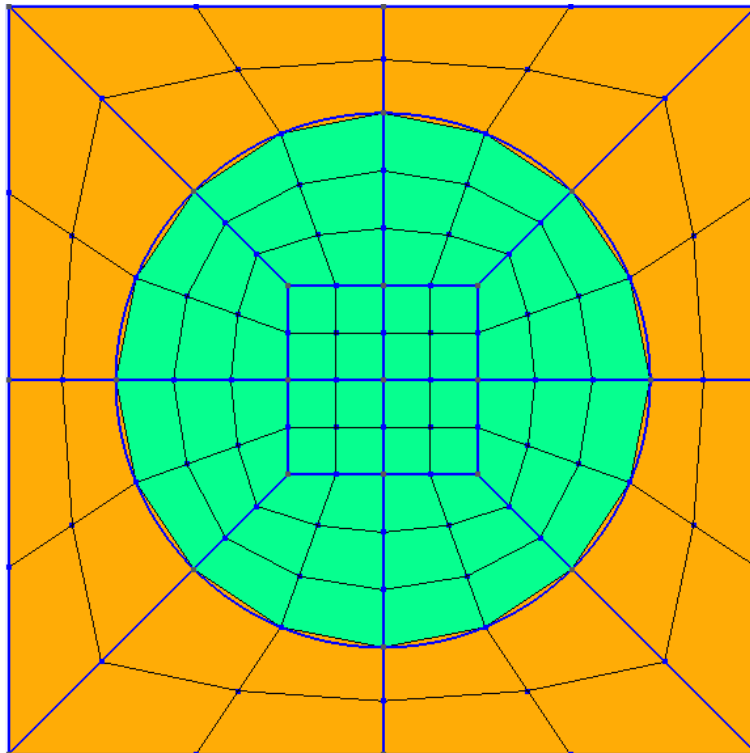


Step 2 : Create geometry

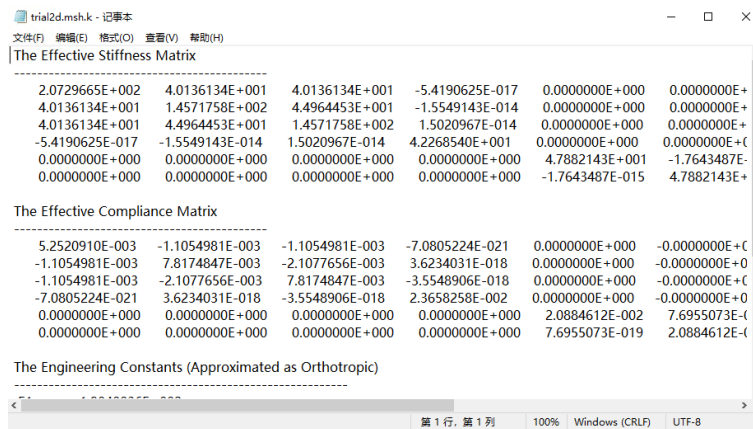
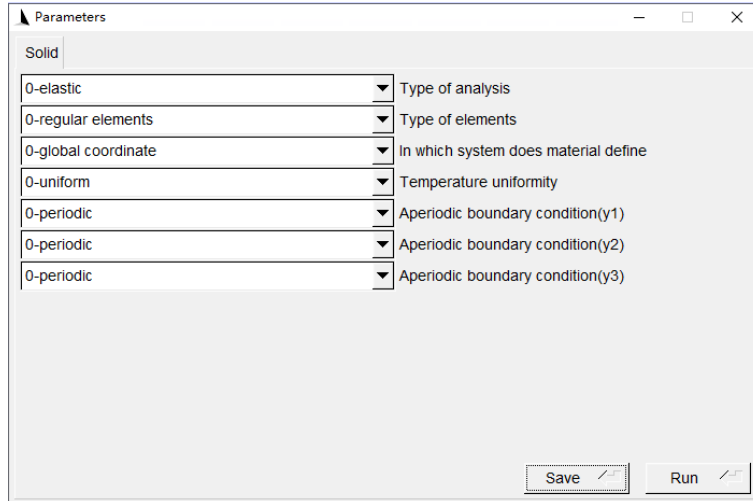




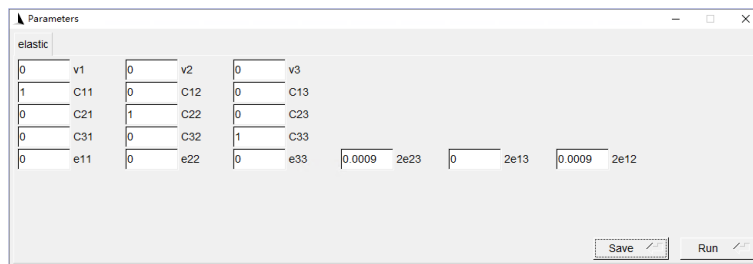
Step 3 : Mesh 2D SG



Step 4 : Homogenization



Step 5 : Dehomogenization(Error...No results found)



```

Info : Loading SwiftComp for homogenization...
Info : Calculating...
Info : Completed!
Info : Done writing input file for dehomogenization.
Info : Loading SwiftComp for dehomogenization...
Info : Calculating...
Info : Reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial2dVIEW.geo'...
Info : Reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial2dVIEW.msh'...
Info : 105 vertices
Info : Vertex numbering is dense
Info : 96 elements
Info : Reading view 'U-Magnitude' step 0 (time 0) partition 0: 105 records
Error : Could not read data in msh file
Error : Error loading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial2dVIEW.msh'
Info : Done reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial2dVIEW.msh'
Info : Done reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial2dVIEW.geo'
Done reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial2dVIEW.geo'

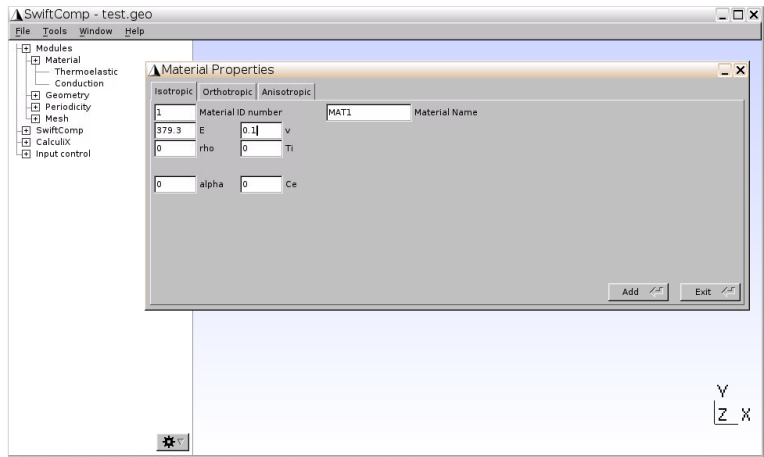
```

trial2dVIEW.geo	2023/9/6 11:26	GEO 文件	1 KB
trial2dVIEW.msh	2023/9/6 11:26	MSH 文件	12 KB
trial2d.msh.ech	2023/9/6 11:25	ECH 文件	19 KB
trial2d.msh.sg	2023/9/6 11:25	SG 文件	0 KB
trial2d.msh.sn	2023/9/6 11:25	SN 文件	0 KB
trial2d.msh.u	2023/9/6 11:25	U 文件	0 KB
trial2d.msh.glb	2023/9/6 11:24	GLB 文件	1 KB
trial2d.msh.opt	2023/9/6 11:22	OPT 文件	14 KB
trial2d.msh	2023/9/6 11:22	MSH 文件	11 KB
trial2d.geo.t	2023/9/6 11:22	T 文件	1 KB
trial2d.geo.t2	2023/9/6 11:22	T2 文件	1 KB
trial2d.geo	2023/9/6 11:20	GEO 文件	5 KB

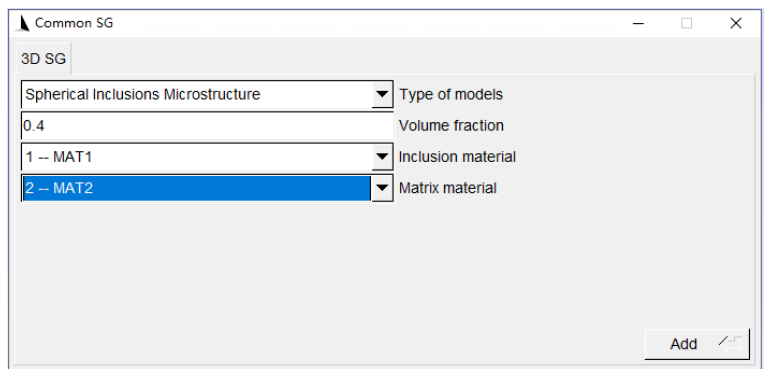
Empty

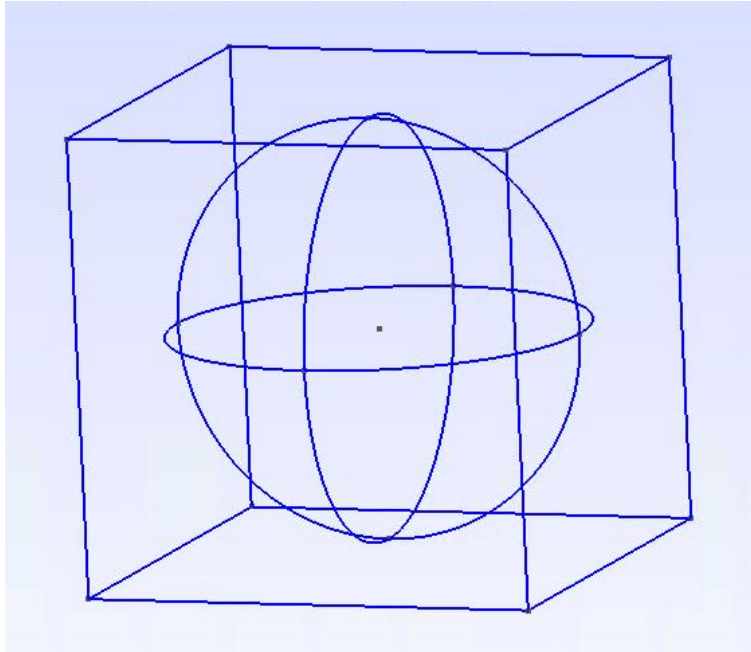
Spherical Inclusions Microstructure (3D)

Step 1 : Create materials

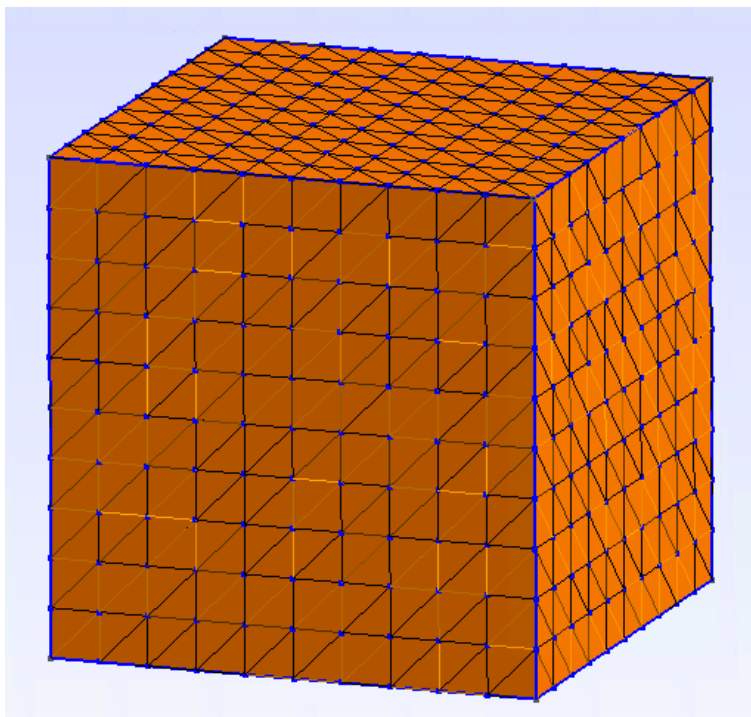


Step 2 : Create geometry

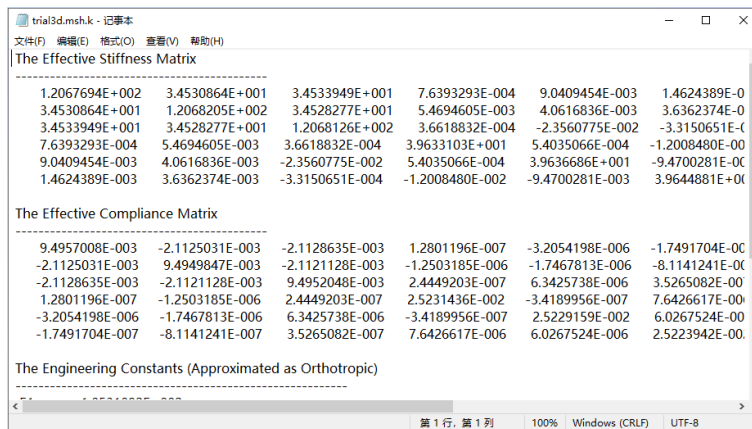
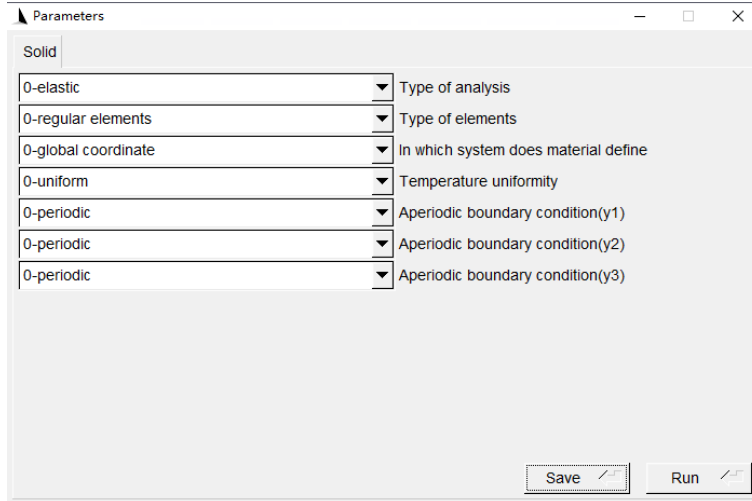




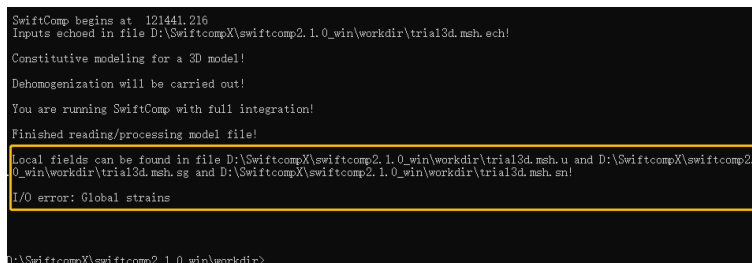
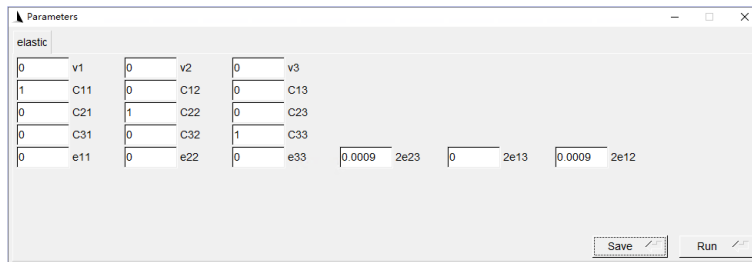
Step 3 : Mesh 3D SG



Step 4 : Homogenization



Step 5 : Dehomogenization(Error...No results found)





```
.....  
Info : Completed!  
Info : Done writing input file for dehomogenization.  
Info : Loading SwiftComp for dehomogenization...  
Info : Calculating...  
Info : Reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial3dVIEW.geo',...  
Info : Reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial3dVIEW.msh',...  
Info : 1175 vertices  
Info : Vertex numbering is dense  
Info : 5088 elements  
Info : Reading view 'U-Magnitude' step 0 (time 0) partition 0: 1175 records  
Error : Could not read data in msh file  
Error : Error loading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial3dVIEW.msh'  
Info : Done reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial3dVIEW.msh',...  
Info : Done reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial3dVIEW.geo'  
Done reading 'D:\Swiftcomp\swiftcomp2.1.0_win\workdir\trial3dVIEW.geo'
```

trial3dVIEW.geo	2023/9/6 12:15	GEO 文件	1 KB
trial3dVIEW.msh	2023/9/6 12:15	MSH 文件	360 KB
trial3d.msh.ech	2023/9/6 12:14	ECH 文件	1,194 KB
trial3d.msh.sg	2023/9/6 12:14	SG 文件	0 KB
trial3d.msh.sn	2023/9/6 12:14	SN 文件	0 KB
trial3d.msh.u	2023/9/6 12:14	U 文件	0 KB
trial3d.msh.glb	2023/9/6 12:14	GLB 文件	1 KB
trial3d.msh.opt	2023/9/6 12:13	OPT 文件	119 KB
trial3d.msh	2023/9/6 12:12	MSH 文件	359 KB
trial3d.geo.t	2023/9/6 12:12	T 文件	1 KB
trial3d.geo.t2	2023/9/6 12:12	T2 文件	1 KB
trial3d.geo	2023/9/6 12:11	GEO 文件	3 KB

Empty!

Reference: *Gmsh4SC USER'S MANUAL March, 2017*