

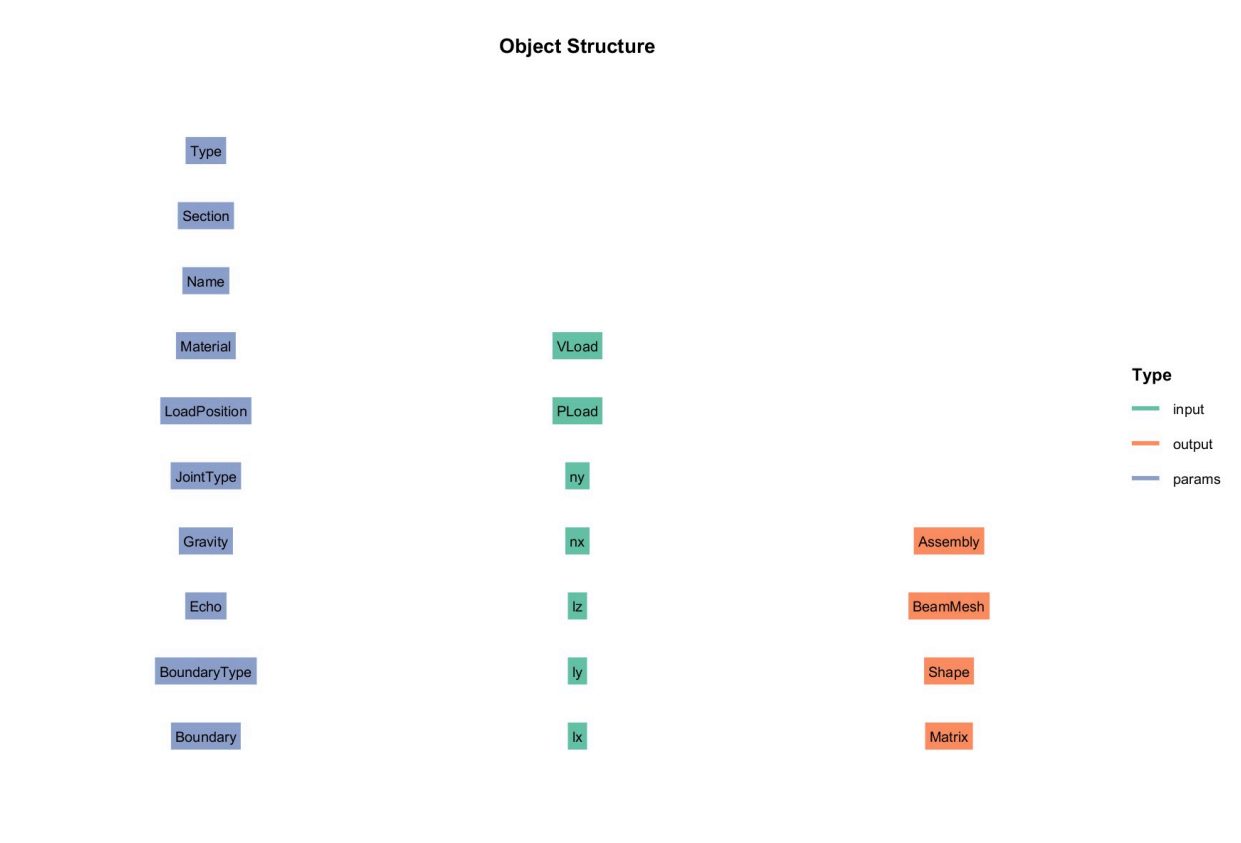
Grid

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1 介绍

Grid类用于生成桁架结构。

2 类结构



输入 input:

- VLoad : 可变荷载
- PLoad : 永久荷载
- ny:
- nx:
- lz: 高
- ly: 宽
- lx: 长

参数 params:

- Name : 名称
- Section :截面属性
- Material: 材料
- Type : 桁架类型
- LoadPosition : 载荷施加位置

- JointType : 节点类型
- Gravity : 重力
- BoundaryType : 边界类型
- Boundary : 边界

输出 output :

- Assembly : 装配体
- BeamMesh : 梁网格
- Matrix : 分类信息
- Shape : 外形

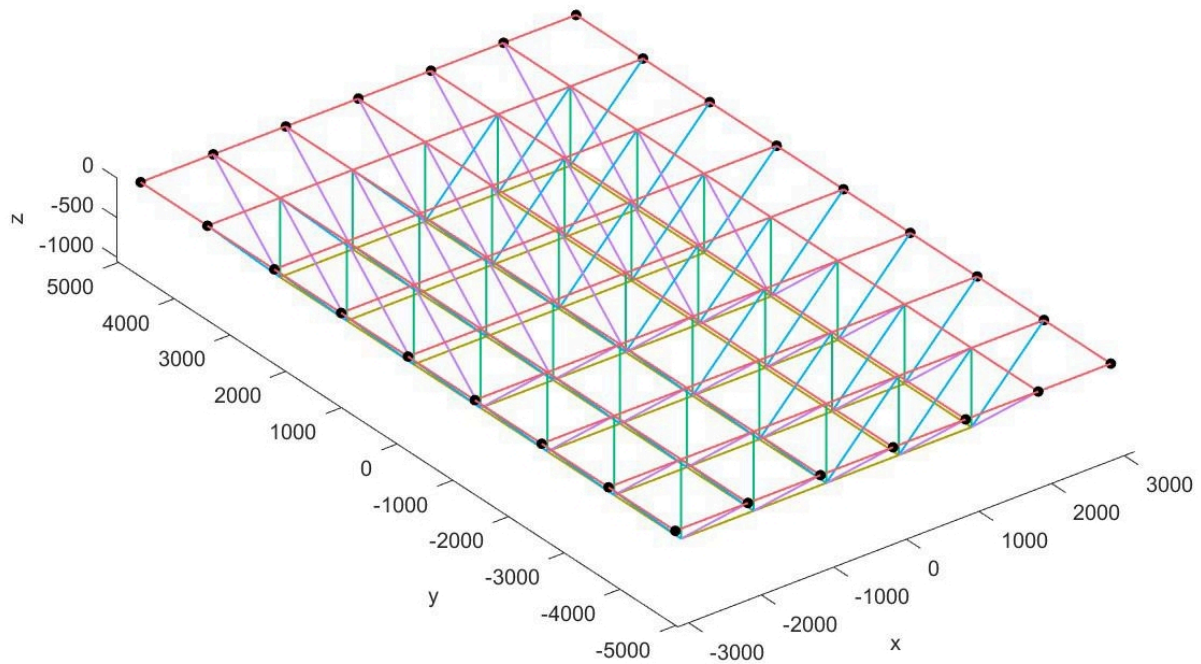
3 案例

3.1 Create Grid Type 1 (Flag=1)

```

1  % Section
2  Section{1,1}.type="beam";
3  Section{1,1}.subtype="CTUBE";
4  Section{1,1}.data=[34,40];
5
6  Section{2,1}.type="beam";
7  Section{2,1}.subtype="CTUBE";
8  Section{2,1}.data=[34,40];
9
10 Section{3,1}.type="beam";
11 Section{3,1}.subtype="CTUBE";
12 Section{3,1}.data=[34,40];
13
14 Section{4,1}.type="beam";
15 Section{4,1}.subtype="CTUBE";
16 Section{4,1}.data=[34,40];
17
18 inputStruct.lx=1000;
19 inputStruct.ly=1200;
20 inputStruct.lz=-1000;
21 inputStruct.nx=7;
22 inputStruct.ny=9;
23 inputStruct.Load=200;
24
25 paramsStruct.Section=Section;
26 obj= structure.Grid(paramsStruct, inputStruct);
27 obj= obj.solve();
28
29 ANSYS_Output(obj.output.Assembly);
30 Plot3D(obj, 'BeamGeom', 1, 'boundary', 1, 'load', 1, 'load_scale', 0.3, 'endrelease', 1)

```

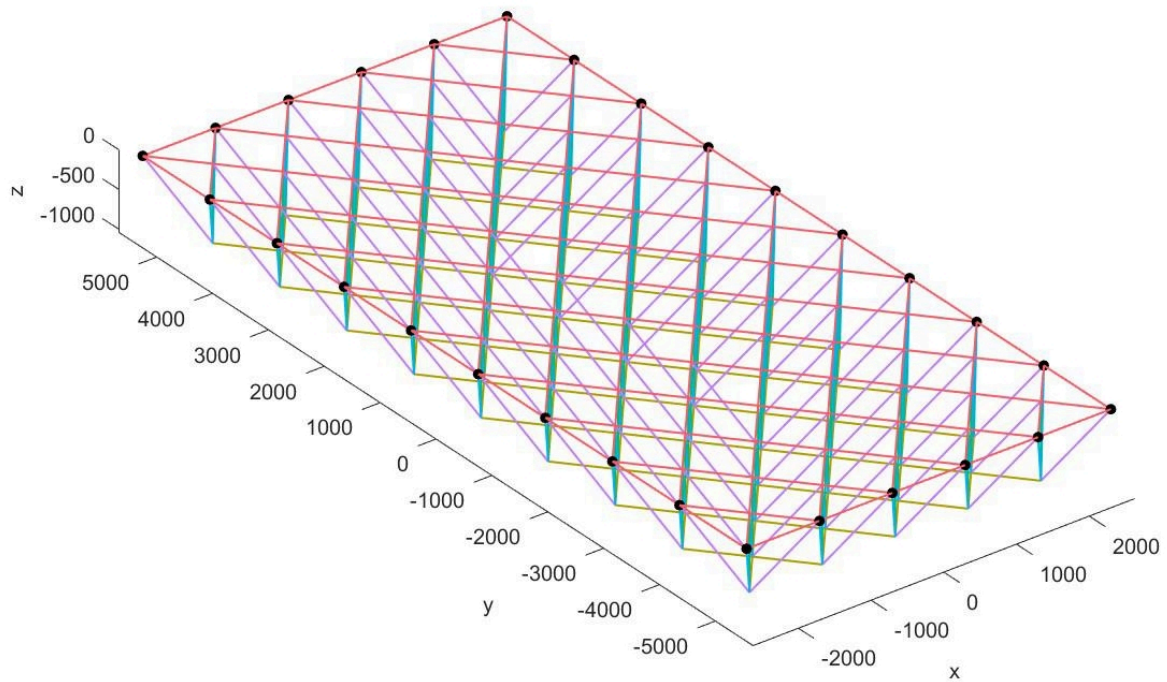


3.2 Create Grid Type 2 (Flag=2)

```

1  % Section
2  Section{1,1}.type="beam";
3  Section{1,1}.subtype="CTUBE";
4  Section{1,1}.data=[34,40];
5  Section{2,1}.type="beam";
6  Section{2,1}.subtype="CTUBE";
7  Section{2,1}.data=[34,40];
8  Section{3,1}.type="beam";
9  Section{3,1}.subtype="CTUBE";
10 Section{3,1}.data=[34,40];
11 Section{4,1}.type="beam";
12 Section{4,1}.subtype="CTUBE";
13 Section{4,1}.data=[34,40];
14
15 inputStruct.lx=1000;
16 inputStruct.ly=1200;
17 inputStruct.lz=-1000;
18 inputStruct.nx=6;
19 inputStruct.ny=10;
20 inputStruct.Load=200;
21
22 paramsStruct.Section=Section;
23 paramsStruct.Type=2;
24 paramsStruct.LoadPosition=2;
25
26 obj= structure.Grid(paramsStruct, inputStruct);
27 obj= obj.solve();
28 ANSYS_Output(obj.output.Assembly);
29 Plot3D(obj, 'BeamGeom',1, 'boundary',1, 'load',1, 'load_scale',0.3, 'endrelease',1)

```

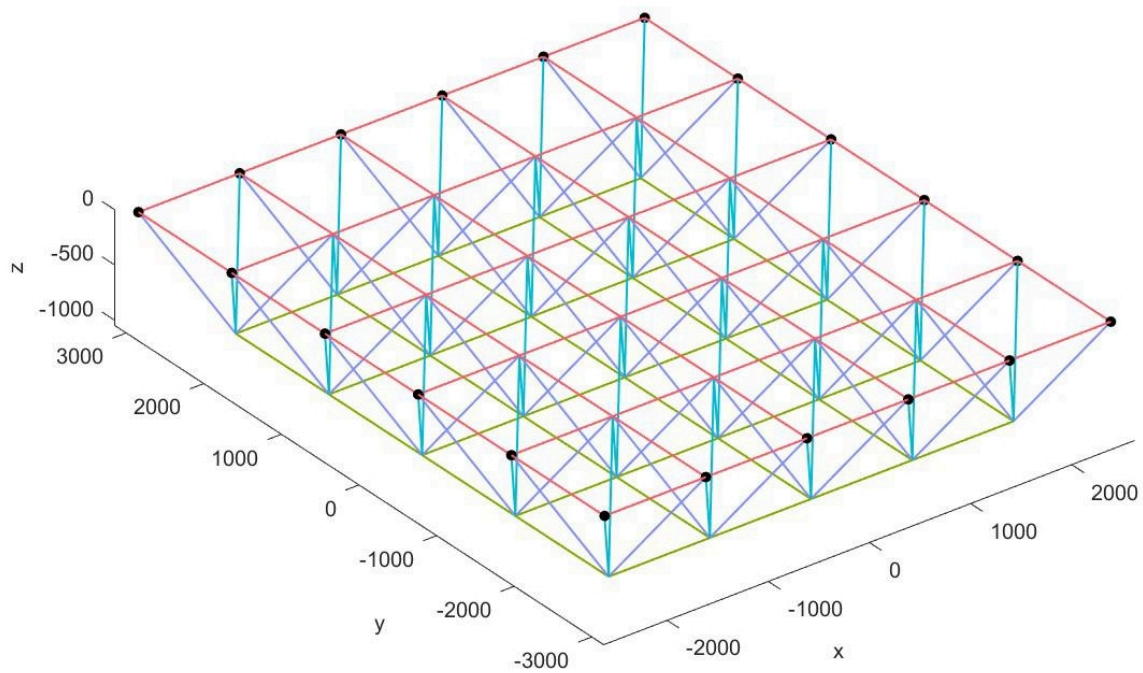


3.3 Create Grid Type 3 (Flag=3)

```

1  % Section
2  Section{1,1}.type="beam";
3  Section{1,1}.subtype="CTUBE";
4  Section{1,1}.data=[34,40];
5  Section{2,1}.type="beam";
6  Section{2,1}.subtype="CTUBE";
7  Section{2,1}.data=[34,40];
8  Section{3,1}.type="beam";
9  Section{3,1}.subtype="CTUBE";
10 Section{3,1}.data=[34,40];
11 inputStruct.lx=1000;
12 inputStruct.ly=1200;
13 inputStruct.lz=-1000;
14 inputStruct.nx=6;
15 inputStruct.ny=6;
16 inputStruct.Load=200;
17 paramsStruct.Section=Section;
18 paramsStruct.Type=3;
19 paramsStruct.LoadPosition=2;
20 obj= structure.Grid(paramsStruct, inputStruct);
21 obj= obj.solve();
22 ANSYS_Output(obj.output.Assembly);
23 Plot3D(obj, 'BeamGeom',1, 'boundary',1, 'load',1, 'load_scale',0.3, 'endrelease',1)

```

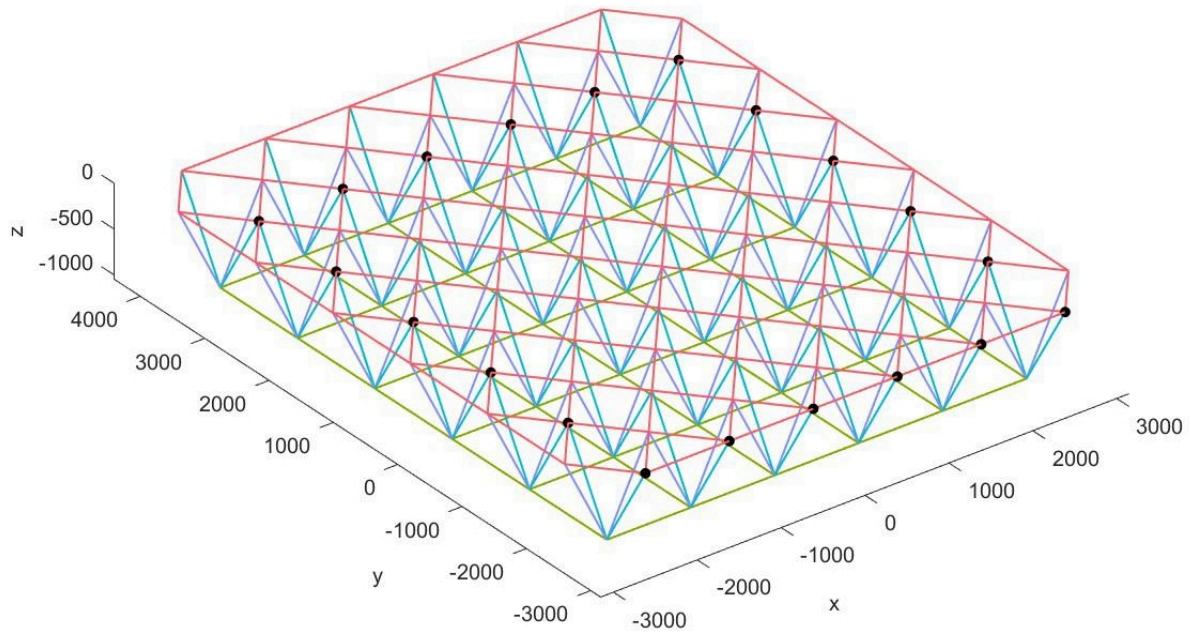


3.4 Create Grid Type 4 (Flag=4)

```

1  % Section
2  Section{1,1}.type="beam";
3  Section{1,1}.subtype="CTUBE";
4  Section{1,1}.data=[34,40];
5  Section{2,1}.type="beam";
6  Section{2,1}.subtype="CTUBE";
7  Section{2,1}.data=[34,40];
8  Section{3,1}.type="beam";
9  Section{3,1}.subtype="CTUBE";
10 Section{3,1}.data=[34,40];
11
12 inputStruct.lx=1000;
13 inputStruct.ly=1200;
14 inputStruct.lz=-1000;
15 inputStruct.nx=6;
16 inputStruct.ny=6;
17 inputStruct.Load=200;
18
19 paramsStruct.Section=Section;
20 paramsStruct.Type=4;
21 paramsStruct.LoadPosition=2;
22 obj= structure.Grid(paramsStruct, inputStruct);
23 obj= obj.solve();
24 ANSYS_Output(obj.output.Assembly);
25 Plot3D(obj, 'BeamGeom',1, 'boundary',1, 'load',1, 'load_scale',0.3, 'endrelease',1)

```

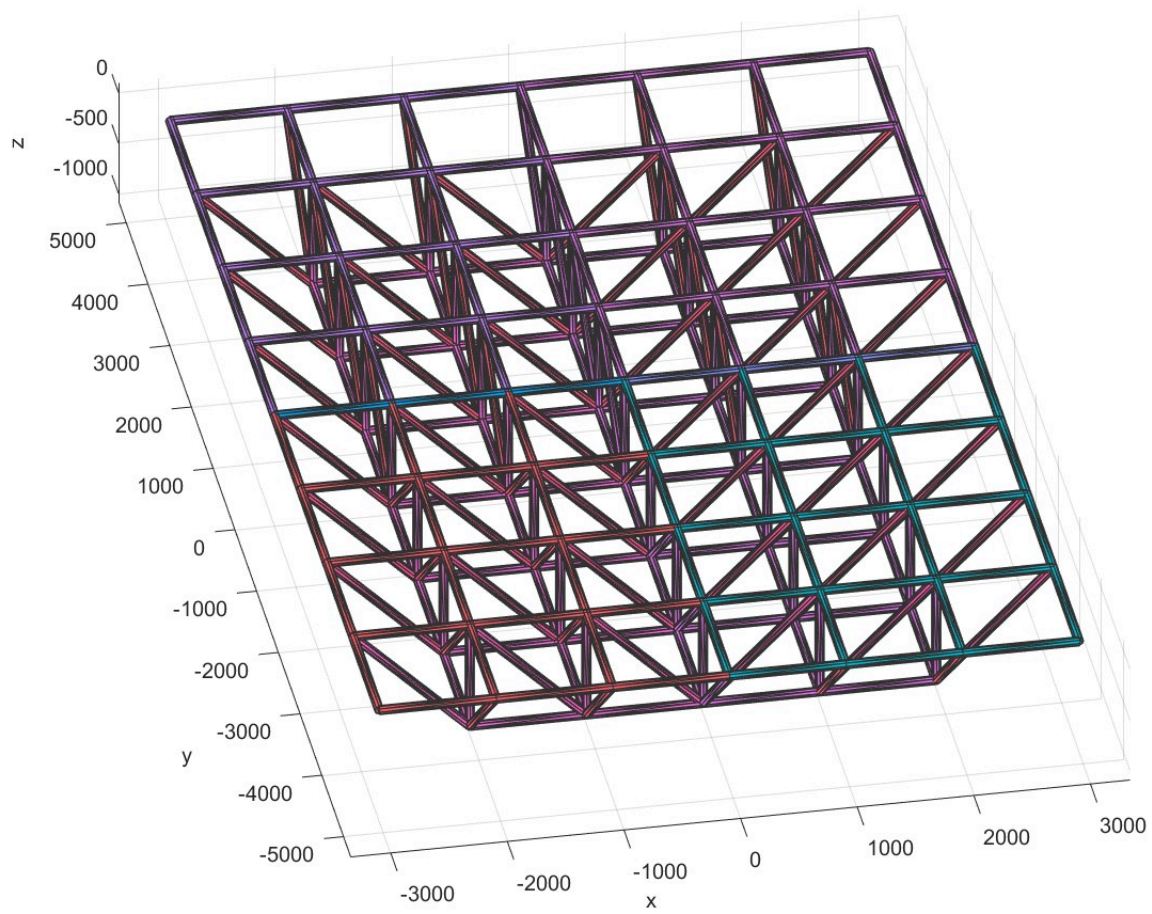


3.5 Output STL file (Flag=5)

```

1  % Section
2  Section{1,1}.type="beam";
3  Section{1,1}.subtype="CTUBE";
4  Section{1,1}.data=[34,40];
5  Section{2,1}.type="beam";
6  Section{2,1}.subtype="CTUBE";
7  Section{2,1}.data=[34,40];
8  Section{3,1}.type="beam";
9  Section{3,1}.subtype="CTUBE";
10 Section{3,1}.data=[34,40];
11 Section{4,1}.type="beam";
12 Section{4,1}.subtype="CTUBE";
13 Section{4,1}.data=[34,40];
14
15 inputStruct.lx=1000;
16 inputStruct.ly=1200;
17 inputStruct.lz=-1000;
18 inputStruct.nx=7;
19 inputStruct.ny=9;
20 inputStruct.Load=200;
21 paramsStruct.JointType=1;
22 paramsStruct.Section=Section;
23 obj= structure.Grid(paramsStruct, inputStruct);
24 obj= obj.solve();
25 OutputSTL(obj)
26 l1=Layer('Layer1');
27 l1=STLRead(l1,strcat(obj.params.Name, '.stl'));
28 Plot(l1);

```

4 参考文献

[1] 空间钢结构APDL参数化计算与分析