

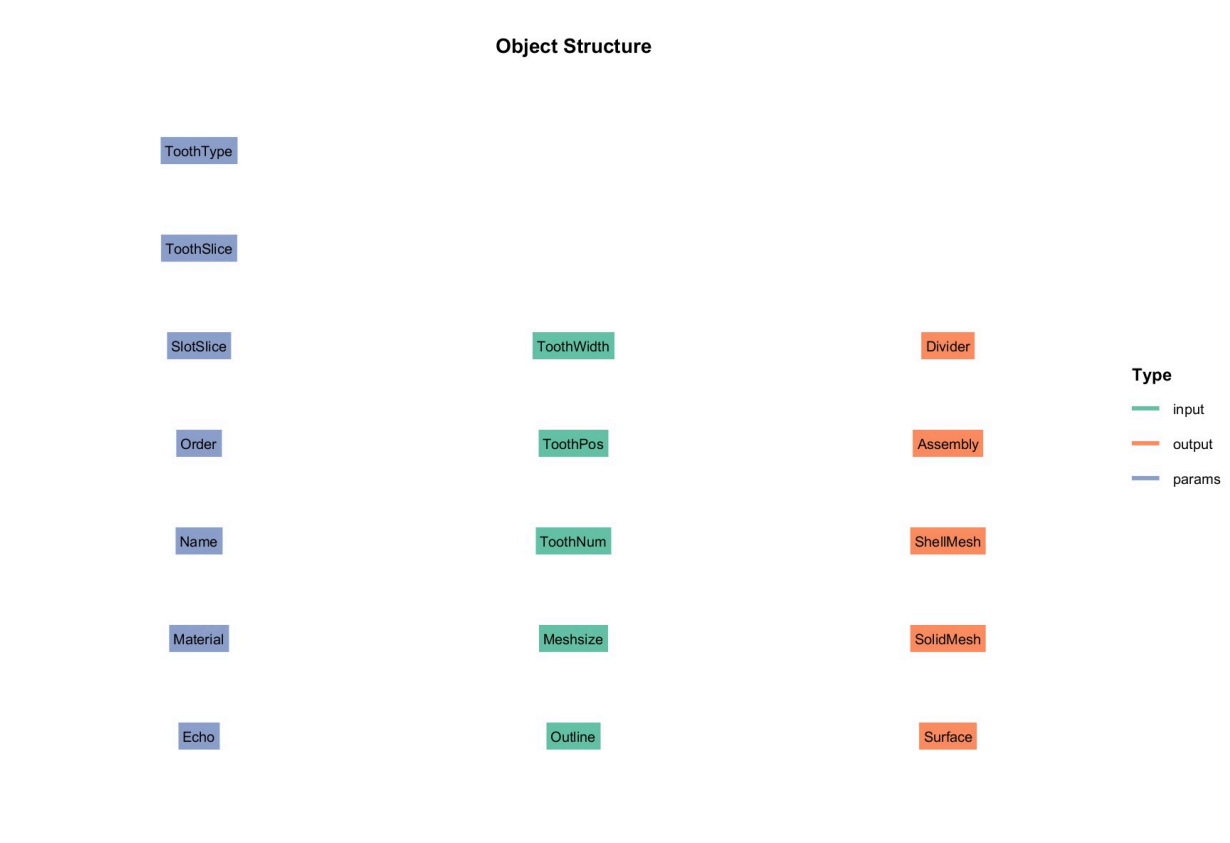
ToothShaft

Xie Yu

1 介绍

ToothShaft可建立端部带齿槽的轴。

2 类结构



输入 input:

- ToothWidth : 齿宽
- ToothPos : 齿部开始位置
- ToothNum : 齿数量
- Meshsize : 网格尺寸
- Outline : 外轮廓Line2D

参数 params:

- Order : 单元阶数
- ToothType : 齿槽类型
- ToothSlice : 齿部网格数量
- SlotSlice : 槽部网格数量
- Name : 名称
- Material : 材料

输出 output :

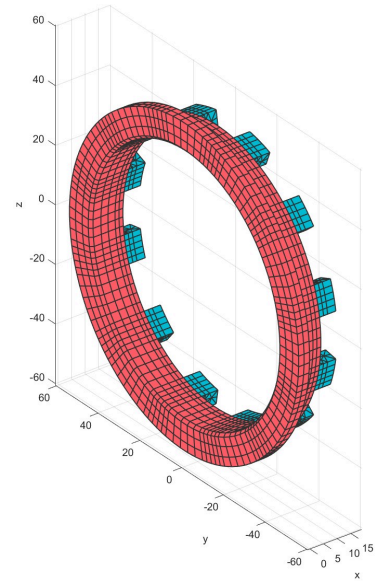
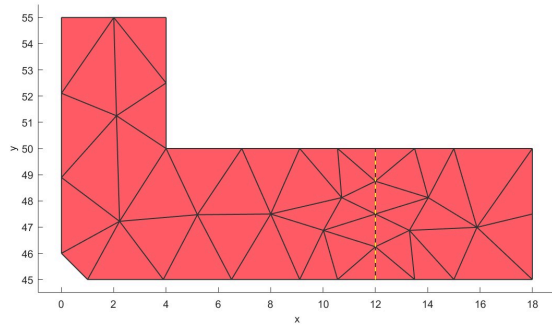
- Assembly : 实体单元装配
- Divider : 分割线
- ShellMesh : 壳网格
- SolidMesh : 实体网格
- Surface : 截面

3 案例

3.1 Create ToothShaft (Flag=1)

生成端部带齿槽轴。

```
1  a=Point2D('Point Ass1');
2  a=AddPoint(a,[0;4],[110/2;110/2]);
3  a=AddPoint(a,[4;4],[110/2;100/2]);
4  a=AddPoint(a,[4;18],[100/2;100/2]);
5  a=AddPoint(a,[18;18],[100/2;90/2]);
6  a=AddPoint(a,[18;1],[90/2;90/2]);
7  a=AddPoint(a,[1;0],[90/2;92/2]);
8  a=AddPoint(a,[0;0],[92/2;110/2]);
9
10 b=Line2D('Line Ass1');
11 for i=1:7
12     b=AddCurve(b,a,i);
13 end
14
15 inputShaft.Outline= b;
16 inputShaft.ToothPos= 12;
17 inputShaft.ToothNum= 12;
18 inputShaft.ToothWidth= 10;
19
20 paramsShaft.ToothSlice= 5;
21 paramsShaft.SlotSlice= 5;
22
23 obj1=shaft.ToothShaft(paramsShaft, inputShaft);
24 obj1=obj1.solve();
25 Plot2D(obj1);
26 Plot3D(obj1);
```



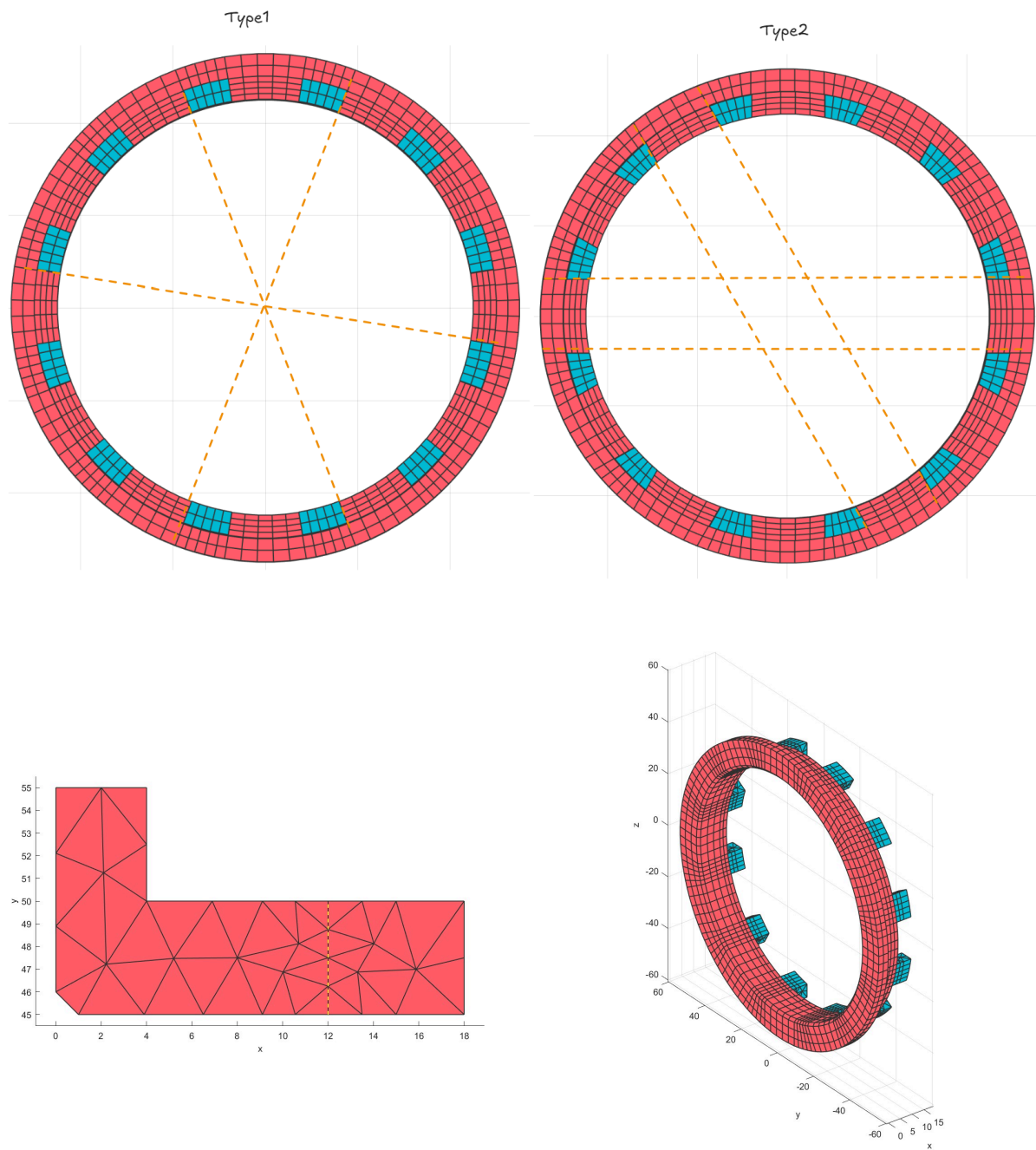
3.2 Change tooth type (Flag=2)

```

1  a=Point2D('Point Ass1');
2  a=AddPoint(a,[0;4],[110/2;110/2]);
3  a=AddPoint(a,[4;4],[110/2;100/2]);
4  a=AddPoint(a,[4;18],[100/2;100/2]);
5  a=AddPoint(a,[18;18],[100/2;90/2]);
6  a=AddPoint(a,[18;1],[90/2;90/2]);
7  a=AddPoint(a,[1;0],[90/2;92/2]);
8  a=AddPoint(a,[0;0],[92/2;110/2]);
9
10 b=Line2D('Line Ass1');
11 for i=1:7
12     b=AddCurve(b,a,i);
13 end
14
15 inputShaft.Outline= b;
16 inputShaft.ToothPos= 12;
17 inputShaft.ToothNum= 12;
18 inputShaft.ToothWidth= 10;
19
20 paramsShaft.ToothSlice= 5;
21 paramsShaft.SlotSlice= 5;
22 paramsShaft.ToothType= 2;
23
24 obj1=shaft.ToothShaft(paramsShaft, inputShaft);
25 obj1=obj1.solve();
26 Plot2D(obj1);
27 Plot3D(obj1);

```

Type1和Type2是两种不同的齿槽，Type1齿部的边界延长线都指向圆心，Type2的边界线为平行线。



3.3 Circle groove slot type (Flag=3)

```

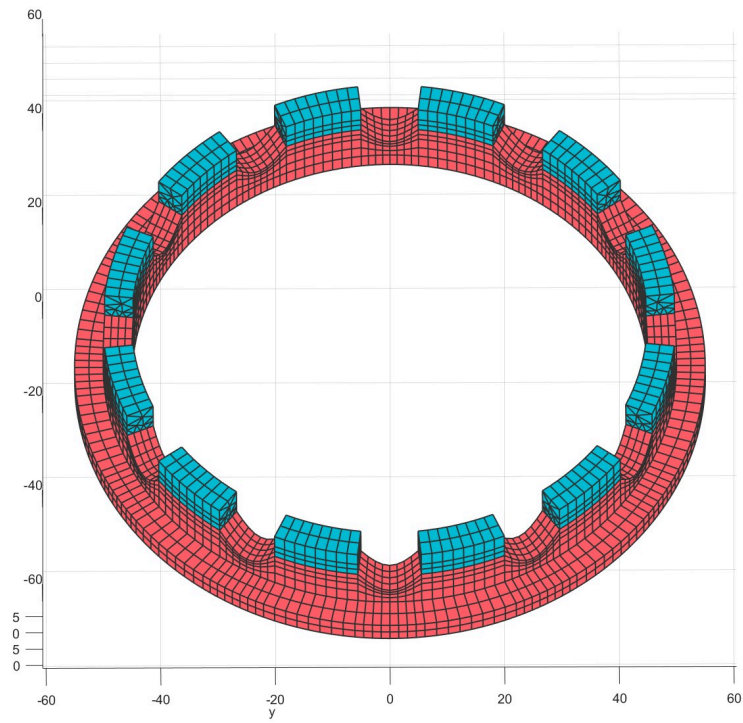
1  a=Point2D('Point Ass1');
2  a=AddPoint(a,[0;4],[110/2;110/2]);
3  a=AddPoint(a,[4;4],[110/2;100/2]);
4  a=AddPoint(a,[4;18],[100/2;100/2]);
5  a=AddPoint(a,[18;18],[100/2;90/2]);
6  a=AddPoint(a,[18;1],[90/2;90/2]);
7  a=AddPoint(a,[1;0],[90/2;92/2]);
8  a=AddPoint(a,[0;0],[92/2;110/2]);
9  b=Line2D('Line Ass1');
10 for i=1:7
11     b=AddCurve(b,a,i);
12 end
13 inputShaft.Outline= b;
14 inputShaft.ToothPos= 12;
15 inputShaft.ToothNum= 12;

```

```

16 inputShaft.ToothWidth= 15;
17 paramsShaft.ToothSlice= 8;
18 paramsShaft.SlotSlice= 8;
19 paramsShaft.ToothType= 1;
20 paramsShaft.SlotType= 2;
21 paramsShaft.LeftLimit= 4;
22 obj1=shaft.ToothShaft(paramsShaft, inputShaft);
23 obj1=obj1.solve();
24 Plot2D(obj1);
25 Plot3D(obj1);

```



4 参考文献