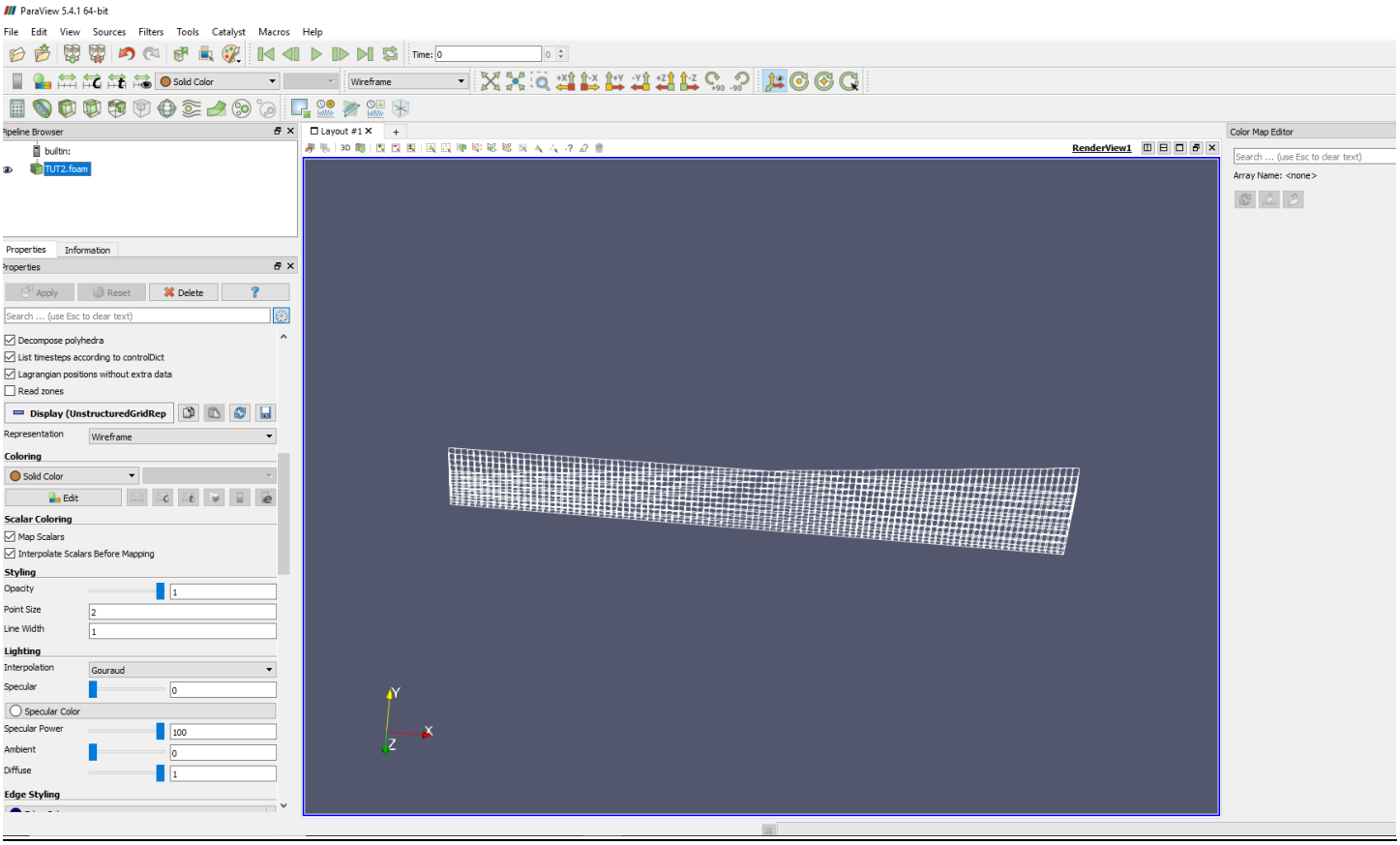
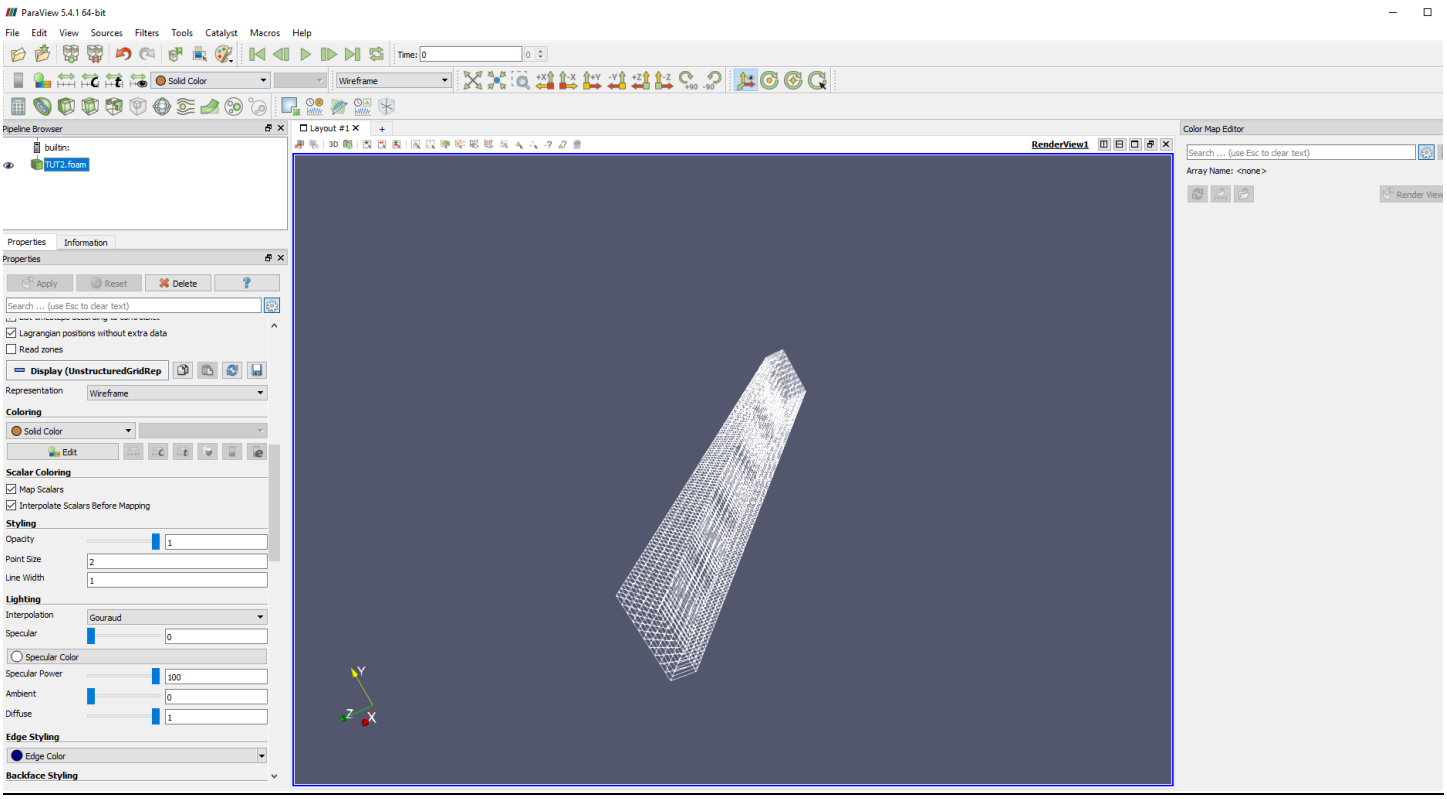
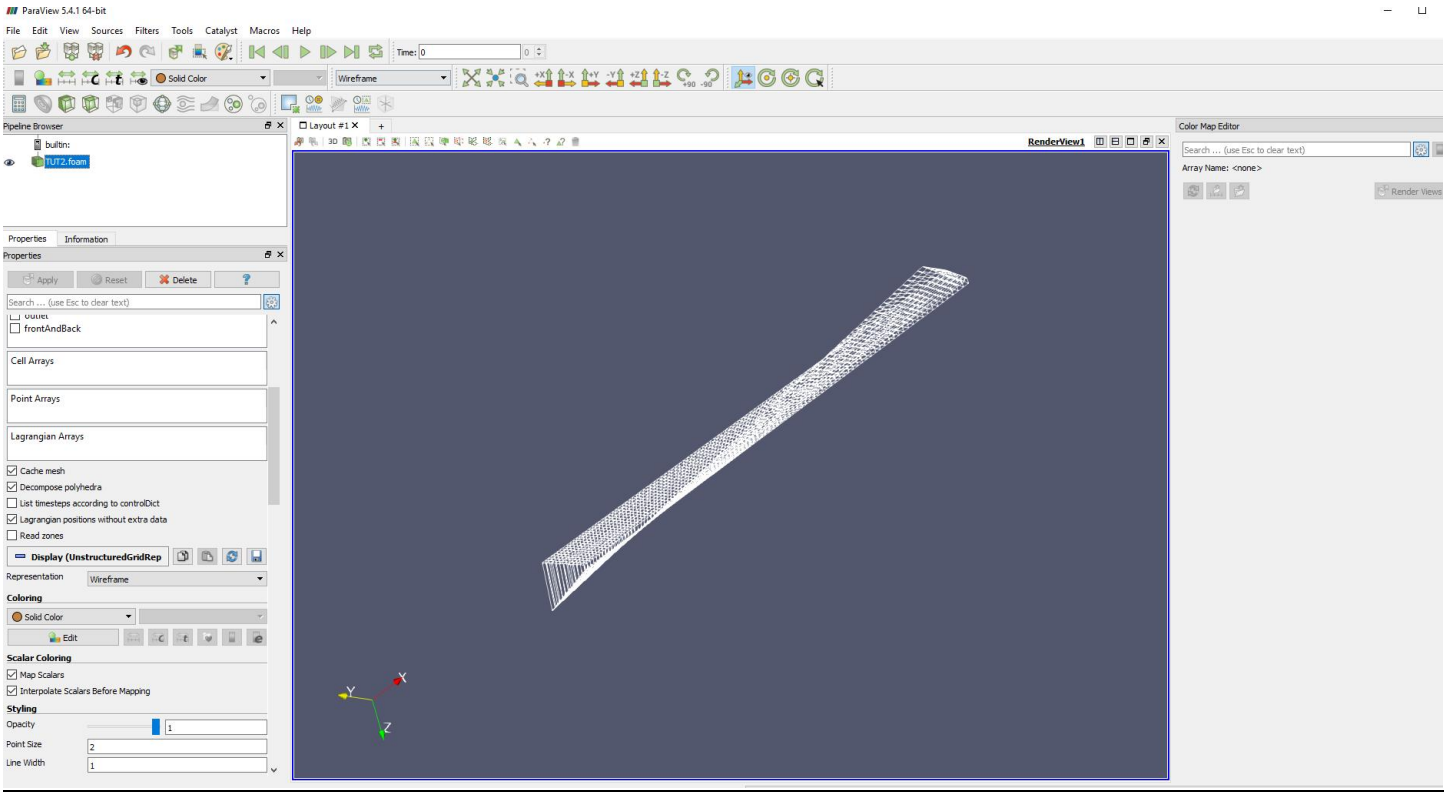
ME 709 Assignment 3

Task 1:

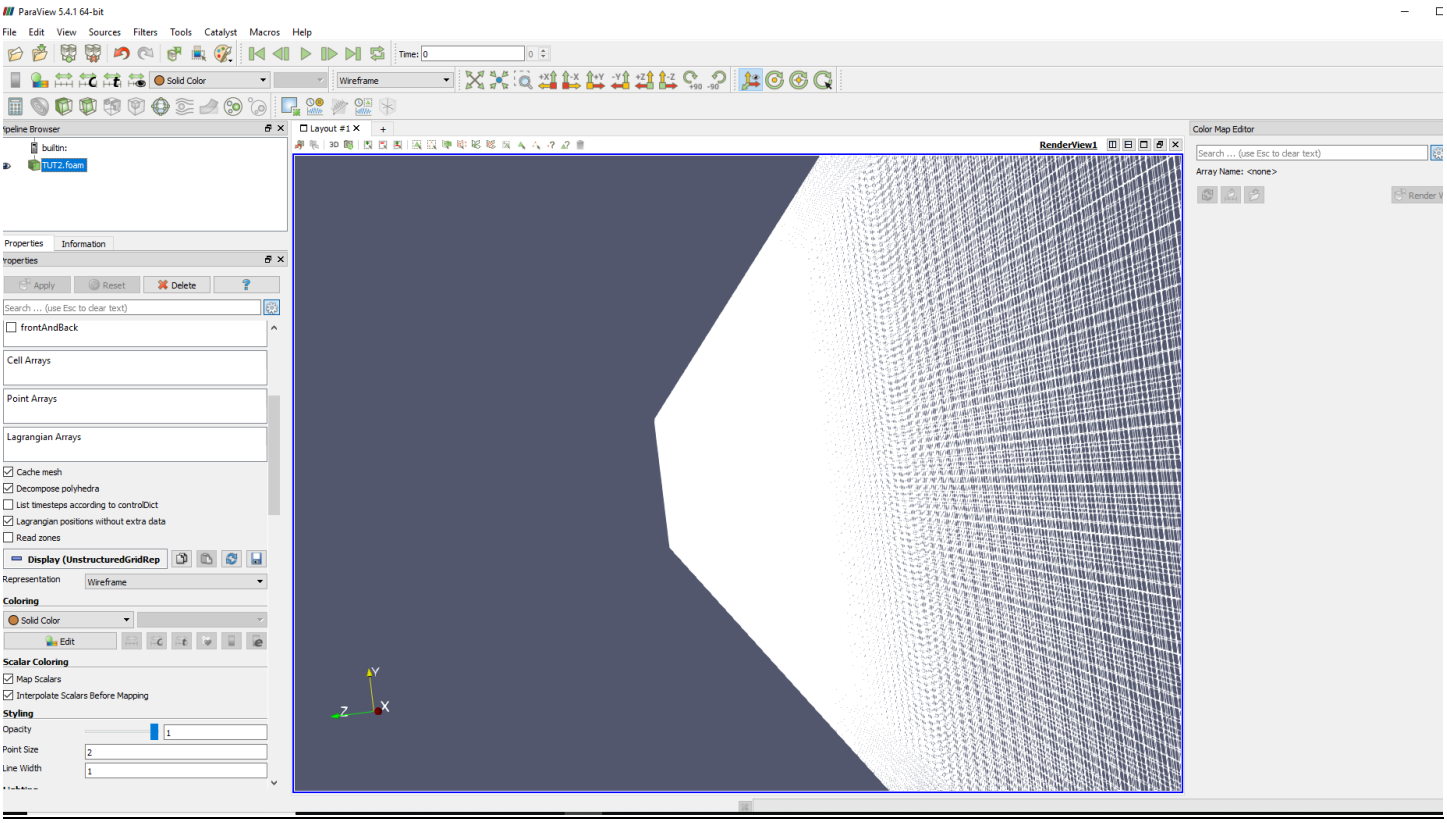


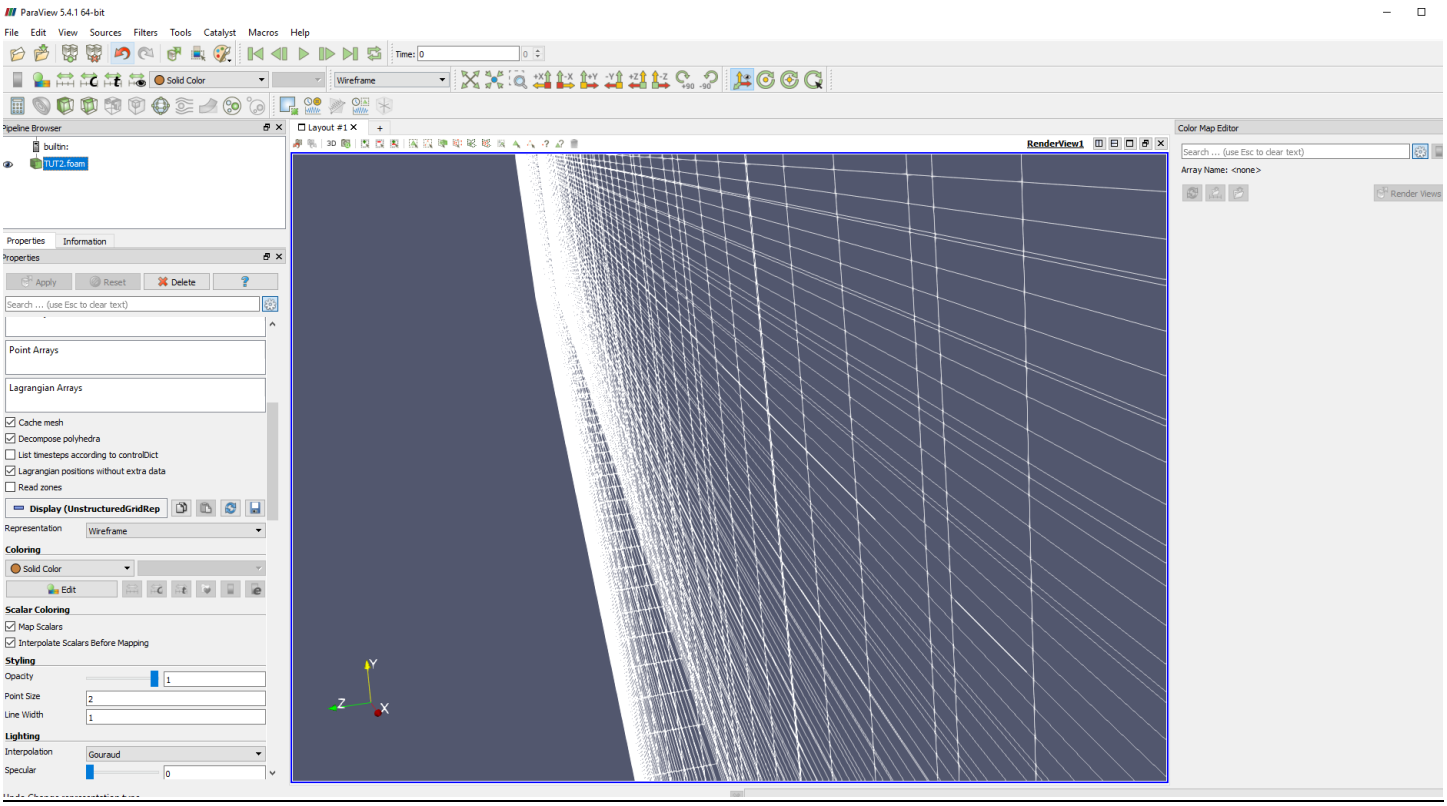




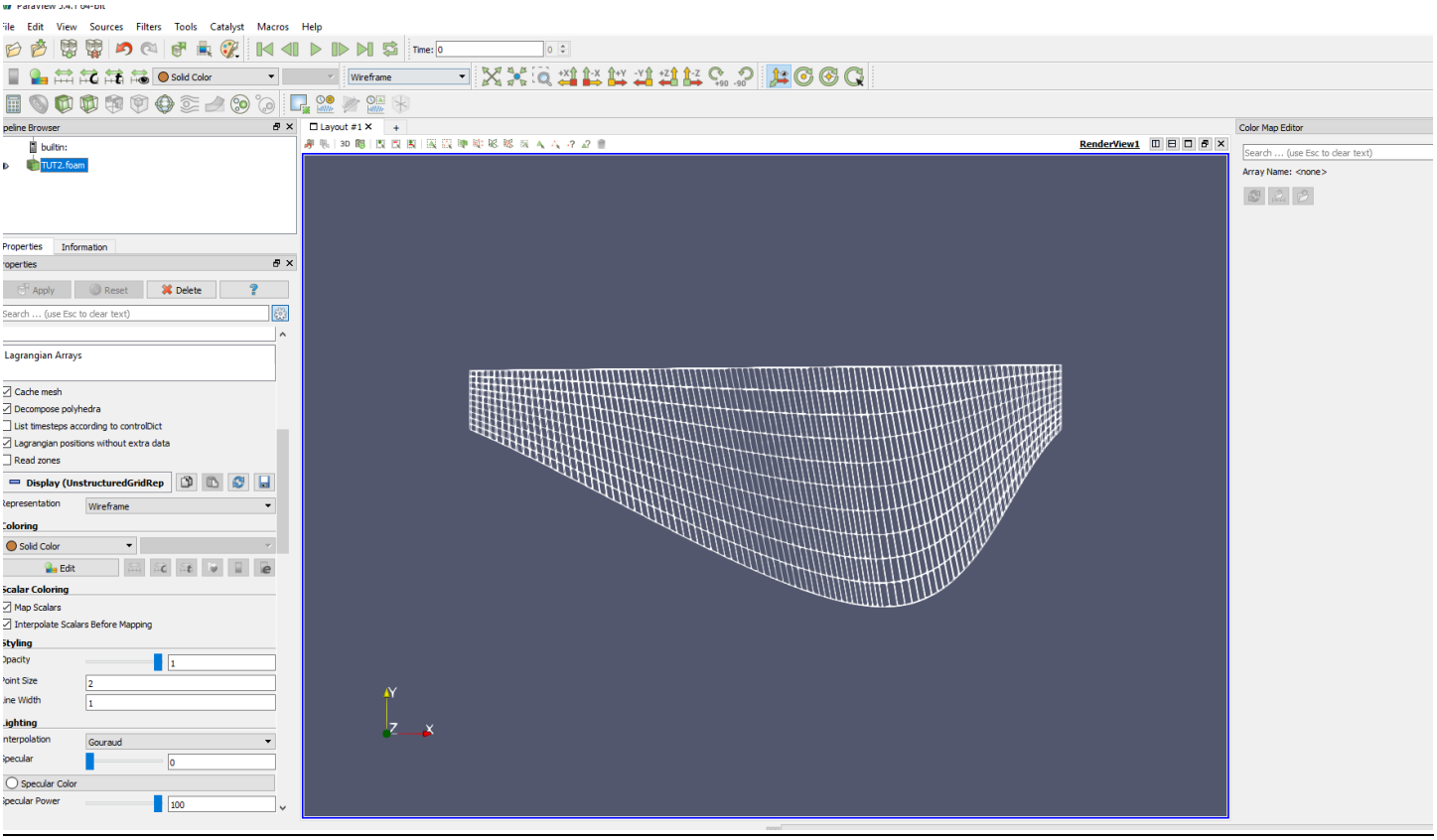
This last image has a coordinate of (0 – 1 – 1) which tapers the object to a distance of zero, which will be interesting to see how that kind of geometry is handled during simulation.

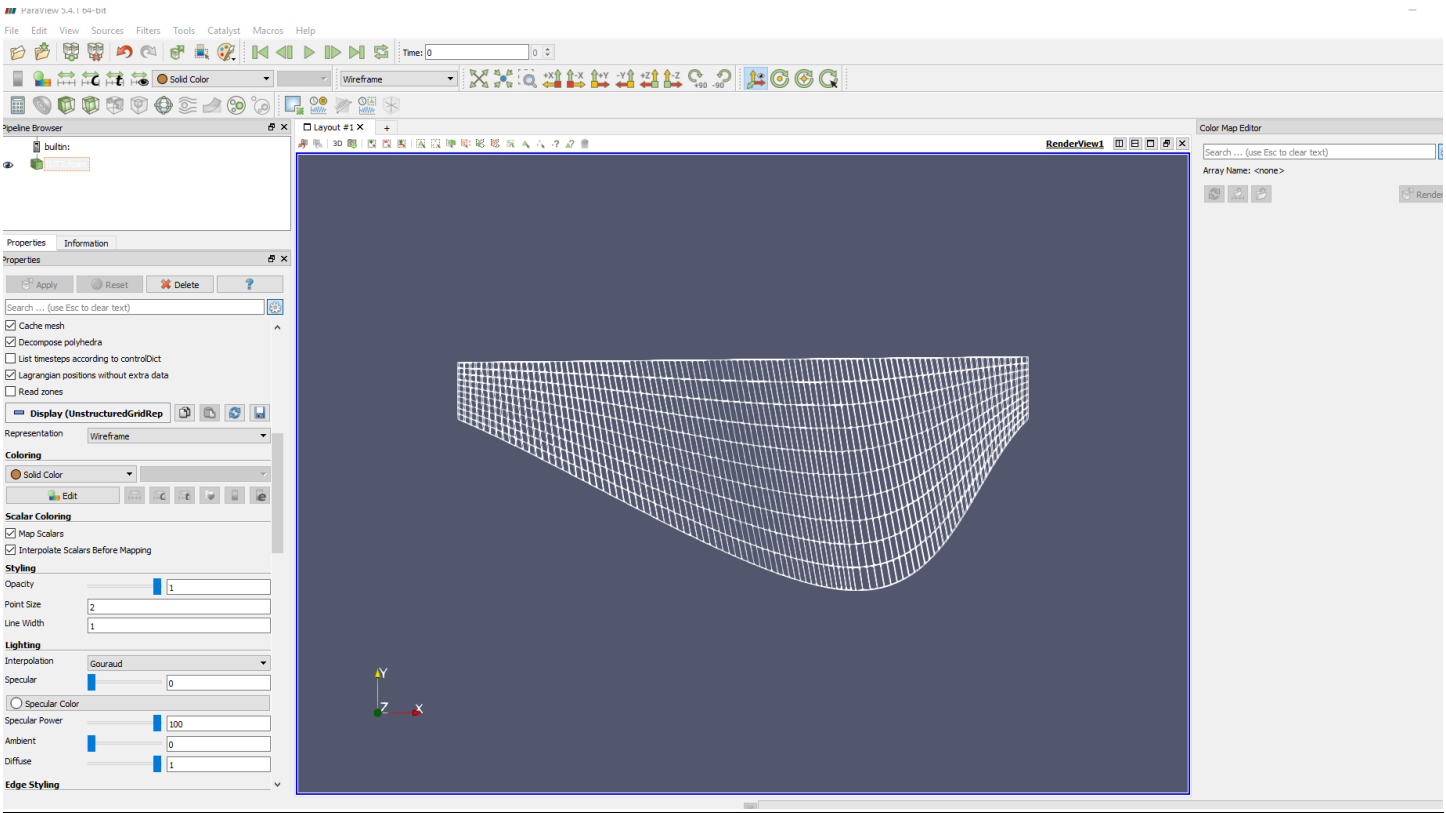
Task 2:

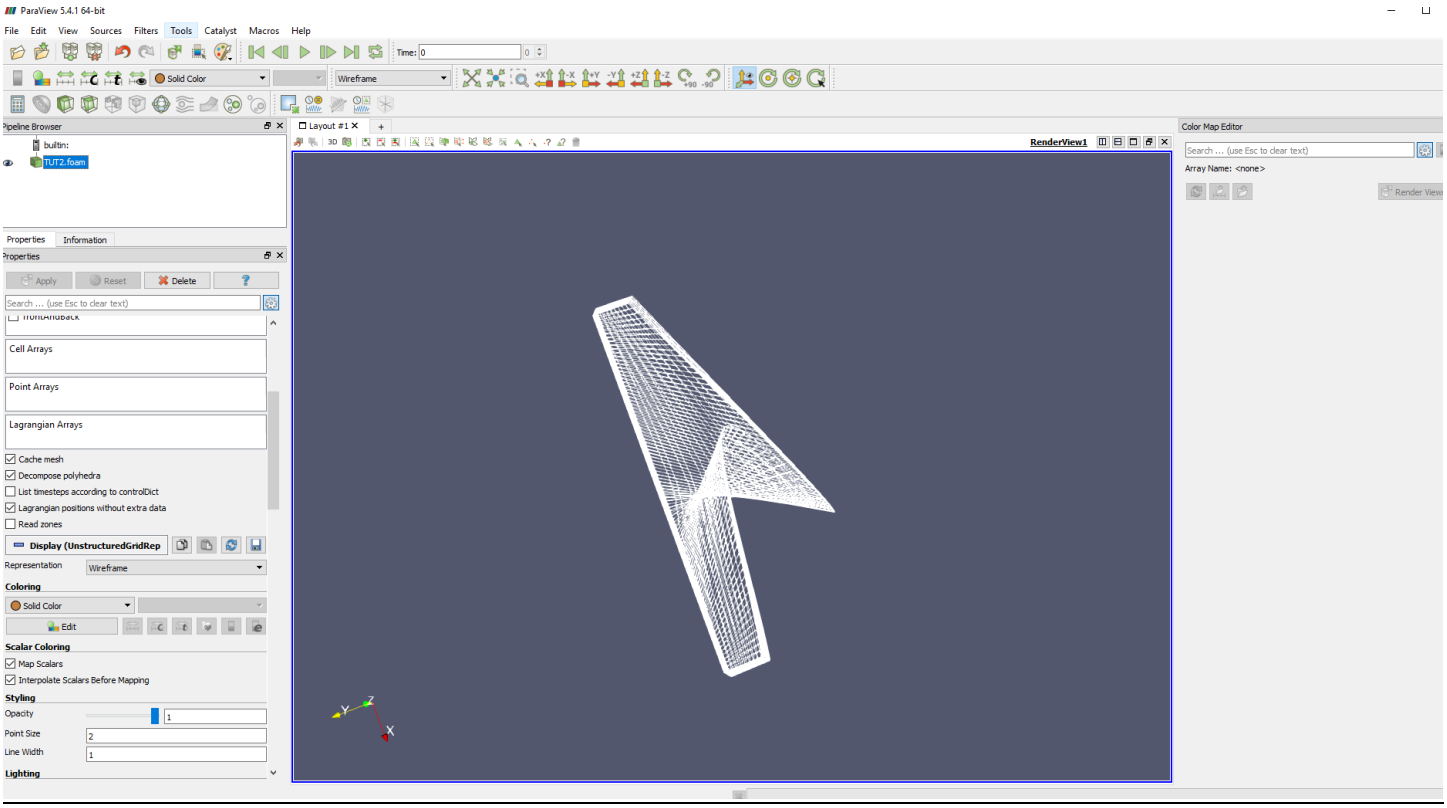

ParaView 5.4.1 64-bit
File Edit View Sources Filters Tools Catalyst Macros Help
Time: 0
Solid Color
Wireframe
Pipeline Browser
builtin:
TUT2.foam
Layout #1
RenderView1
Color Map Editor
Search ... (use Esc to clear text)
Array Name: <none>
Properties
Information
Apply
Reset
Delete
Search ... (use Esc to clear text)
frontAndBack
Cell Arrays
Point Arrays
Lagrangian Arrays
Cache mesh
Decompose polyhedra
List timesteps according to controlDict
Lagrangian positions without extra data
Read zones
Display (UnstructuredGridRep
Representation
Wireframe
Coloring
Solid Color
Edit
Scalar Coloring
Map Scalars
Interpolate Scalars Before Mapping
Styling
Opacity
Point Size
Line Width
Y
Z
X


ParaView 5.4.1 64-bit
File Edit View Sources Filters Tools Catalyst Macros Help
Time: 0
Solid Color
Wireframe
Pipeline Browser
builtin:
TUT2.foam
Layout #1
RenderView1
Color Map Editor
Search ... (use Esc to clear text)
Array Name: <none>
Properties
Information
Apply
Reset
Delete
Search ... (use Esc to clear text)
Point Arrays
Lagrangian Arrays
Cache mesh
Decompose polyhedra
List timesteps according to controlDict
Lagrangian positions without extra data
Read zones
Display (UnstructuredGridRep
Representation
Wireframe
Coloring
Solid Color
Edit
Scalar Coloring
Map Scalars
Interpolate Scalars Before Mapping
Styling
Opacity
Point Size
Line Width
Lighting
Interpolation
Gouraud
Specular
Y
Z
X

Task 3:


File Edit View Sources Filters Tools Catalyst Macros Help
Time: 0
Solid Color
Wireframe
builtin:
TUT2.foam
Properties Information
Apply Reset Delete
Search ... (use Esc to clear text)
Lagrangian Arrays
Cache mesh
Decompose polyhedra
List timesteps according to controlDict
Lagrangian positions without extra data
Read zones
Display (UnstructuredGridRep
Representation Wireframe
Coloring
Solid Color
Edit
Scalar Coloring
Map Scalars
Interpolate Scalars Before Mapping
Styling
Opacity 1
Point Size 2
Line Width 1
Lighting
Interpolation Gouraud
Specular 0
Specular Color
Specular Power 100
Layout #1
RenderView1
Color Map Editor
Search ... (use Esc to clear text)
Array Name: <none>


File Edit View Sources Filters Tools Catalyst Macros Help
Time: 0
Solid Color
Wireframe
builtin:
Properties Information
Apply Reset Delete
Search ... (use Esc to clear text)
Cache mesh
Decompose polyhedra
List timesteps according to controlDict
Lagrangian positions without extra data
Read zones
Display (UnstructuredGridRep
Representation Wireframe
Coloring
Solid Color
Edit
Scalar Coloring
Map Scalars
Interpolate Scalars Before Mapping
Styling
Opacity 1
Point Size 2
Line Width 1
Lighting
Interpolation Gouraud
Specular 0
Specular Color
Specular Power 100
Ambient 0
Diffuse 1
Edge Styling
Layout #1
RenderView1
Color Map Editor
Search ... (use Esc to clear text)
Array Name: <none>

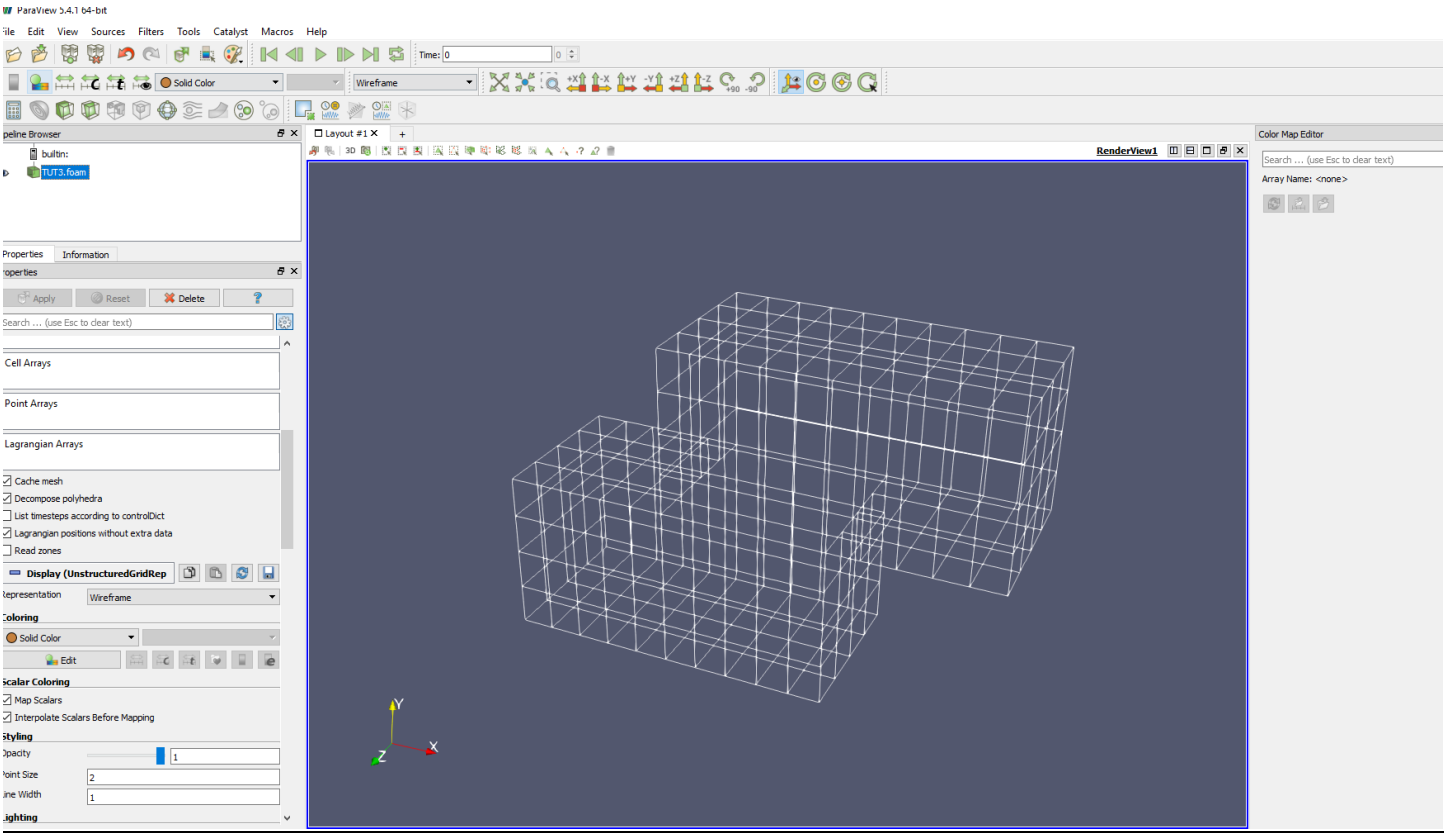

ParaView 5.4.1 64-bit
File Edit View Sources Filters Tools Catalyst Macros Help
Time: 0
Solid Color
Wireframe
Pipeline Browser
builtin:
TUT2.foam
Properties
Information
Apply
Reset
Delete
Search ... (use Esc to clear text)
Cell Arrays
Point Arrays
Lagrangian Arrays
Cache mesh
Decompose polyhedra
List timesteps according to controlDict
Lagrangian positions without extra data
Read zones
Display (UnstructuredGridRep
Representation
Wireframe
Coloring
Solid Color
Edit
Scalar Coloring
Map Scalars
Interpolate Scalars Before Mapping
Styling
Opacity
Point Size
Line Width
Lighting
Layout #1
RenderView1
Color Map Editor
Search ... (use Esc to clear text)
Array Name: <none>

Task 4:

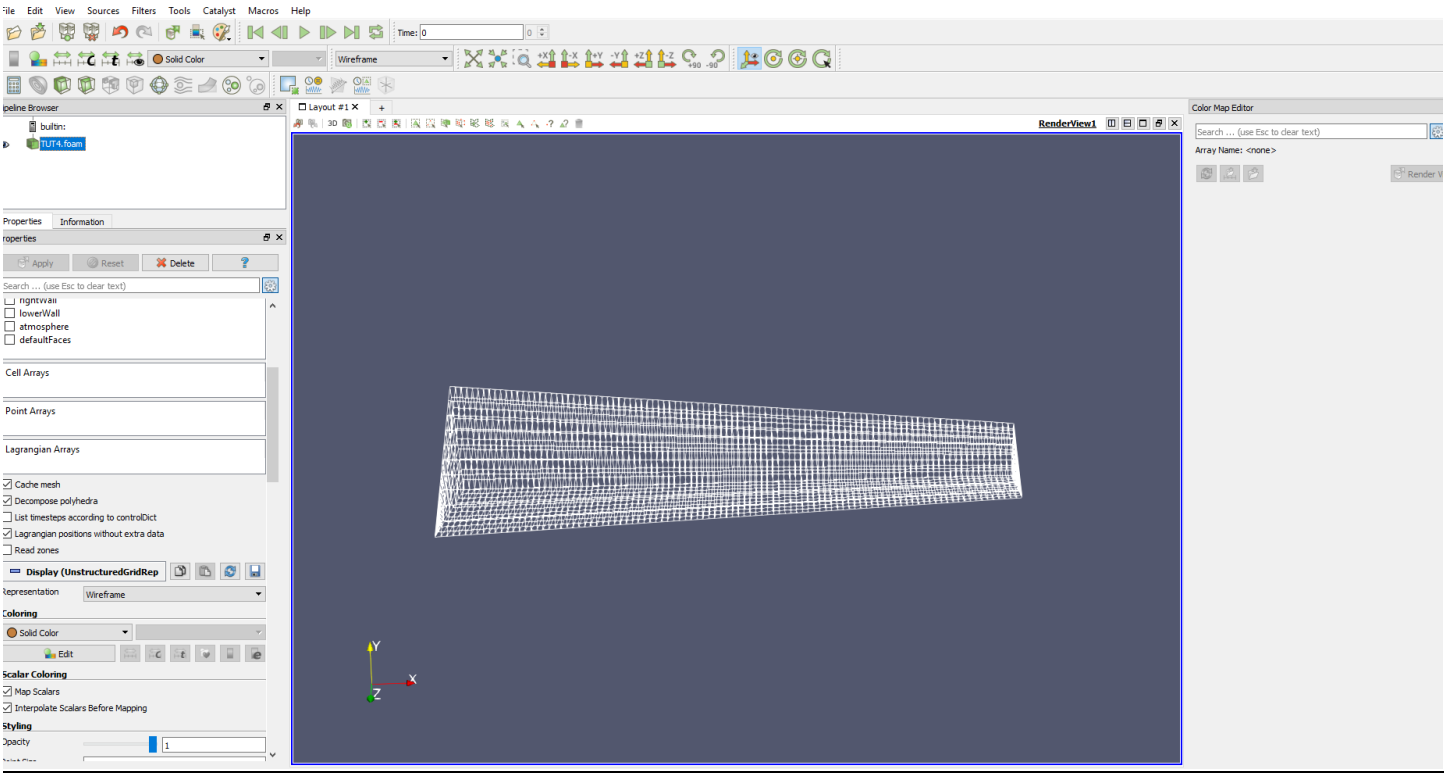
```
/*--------------------------------*- C++ -*----------------------------------*\
| =========                 |                                                 |
| \\      /  F ield         | OpenFOAM: The Open Source CFD Toolbox           |
|  \\    /   O peration     | Version:  2.2.1                                 |
|   \\  /    A nd           | Web:      www.OpenFOAM.org                      |
|    \\/     M anipulation  |                                                 |
\*---------------------------------------------------------------------------*/
FoamFile
{
    version     2.0;
    format      ascii;
    class       dictionary;
    object      blockMeshDict;
}
// * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * //

convertToMeters 1;

vertices
(
(0 0 0) //a
(2 0 0)
(2 1 0)
(0 1 0)
(0 0 1)
(2 0 1)
(2 1 1)
(0 1 1)
(1 1 0) //b
(3 1 0)
(3 2 0)
(1 2 0)
(1 1 1)
(3 1 1)
(3 2 1)
(1 2 1)


);

blocks
(
hex (0 1 2 3 4 5 6 7) (10 4 4) simpleGrading (1 1 1)
```

```
43 hex (0 1 2 3 4 5 6 7) (10 4 4) simpleGrading (1 1 1)
44 hex (8 9 10 11 12 13 14 15) (10 4 4) simpleGrading (1 1 1)
45
46 );
47
48 edges
49 (
50 );
51
52 patches
53 (
54 patch inlet
55 (
56 (0 4 7 3)
57 (8 12 15 11)
58
59 )
60 patch outlet
61 (
62 //(25 26 30 29)
63 //(33 34 38 37)
64
65 )
66 wall upper
67 (
68 (11 15 14 10)
69 //(19 23 22 18)
70 //(27 31 30 26)
71 )
72 wall lower
73 (
74 (0 1 5 4)
75 (1 2 6 5)
76 //(16 17 21 20)
77 //(32 33 37 36)
78 //(32 36 39 35)
79
80 )
81 wall front
82 (
83 (4 5 6 7)
84 (12 13 14 15)
85 //(20 21 22 23)
```

```
80 )
81 wall front
82 (
83 (4 5 6 7)
84 (12 13 14 15)
85 //(20 21 22 23)
86 //(28 29 30 31)
87 //(36 37 38 39)
88 )
89 wall back
90 (
91 (0 3 2 1)
92 (8 11 10 9)
93 //(16 19 18 17)
94 //(24 27 26 25)
95 //(32 35 34 33)
96 )
97
98 patch i1
99 (
00 (3 7 6 2)
01 )
02
03 patch i2
04 (
05 (8 9 13 12)
06 )
07
08 patch i3
09 (
10 (9 10 14 13)
11 )
12
```


ParaView 5.4.1 64-bit
File Edit View Sources Filters Tools Catalyst Macros Help
Time: 0
Solid Color
Wireframe
Pipeline Browser
builtin:
TUT3.foam
Layout #1
RenderView1
Color Map Editor
Search ... (use Esc to clear text)
Array Name: <none>
Properties
Information
Apply
Reset
Delete
Search ... (use Esc to clear text)
Cell Arrays
Point Arrays
Lagrangian Arrays
Cache mesh
Decompose polyhedra
List timesteps according to controlDict
Lagrangian positions without extra data
Read zones
Display (UnstructuredGridRep
Representation
Wireframe
Coloring
Solid Color
Edit
Scalar Coloring
Map Scalars
Interpolate Scalars Before Mapping
Styling
Opacity
Point Size
Line Width
Lighting
Y
Z
X

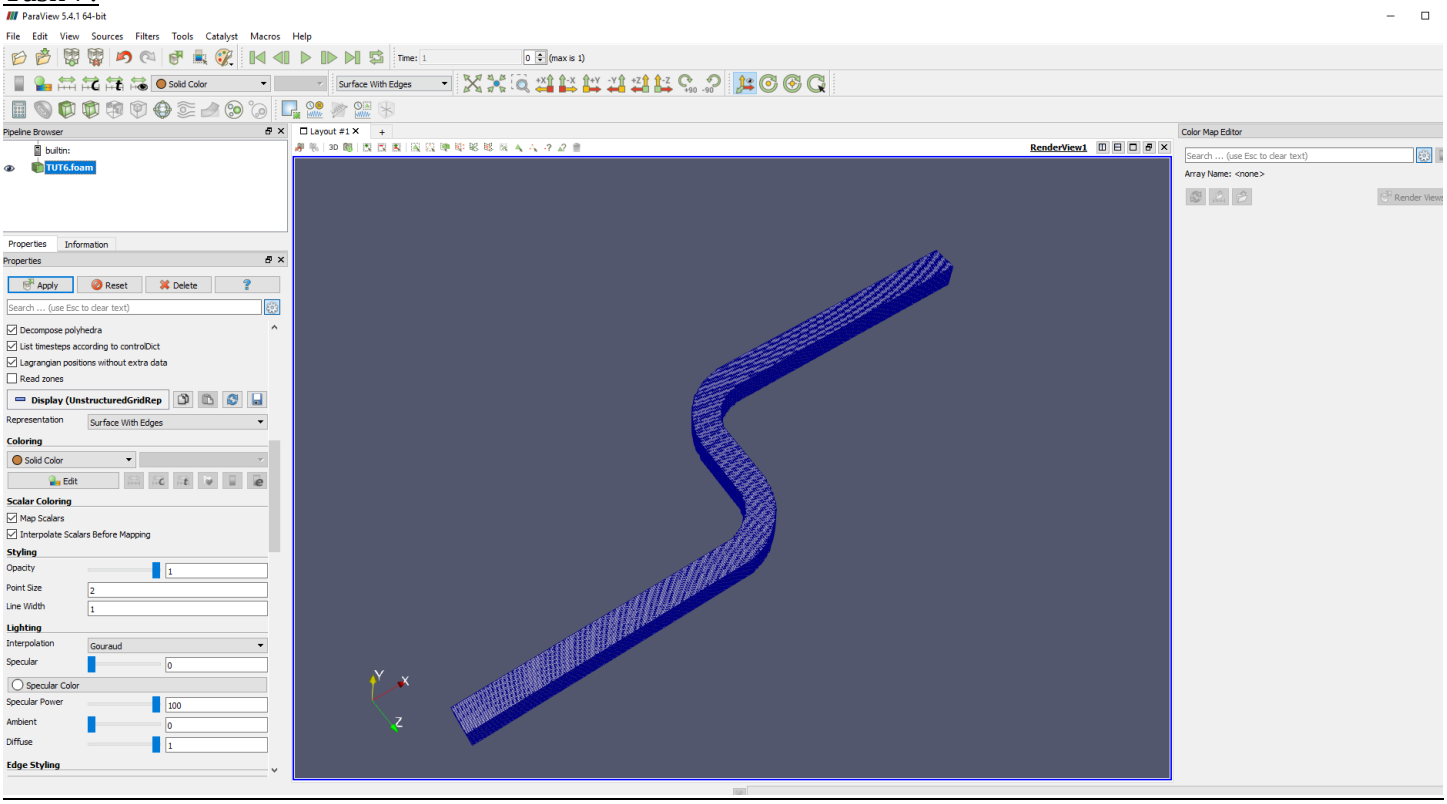
Task 5:

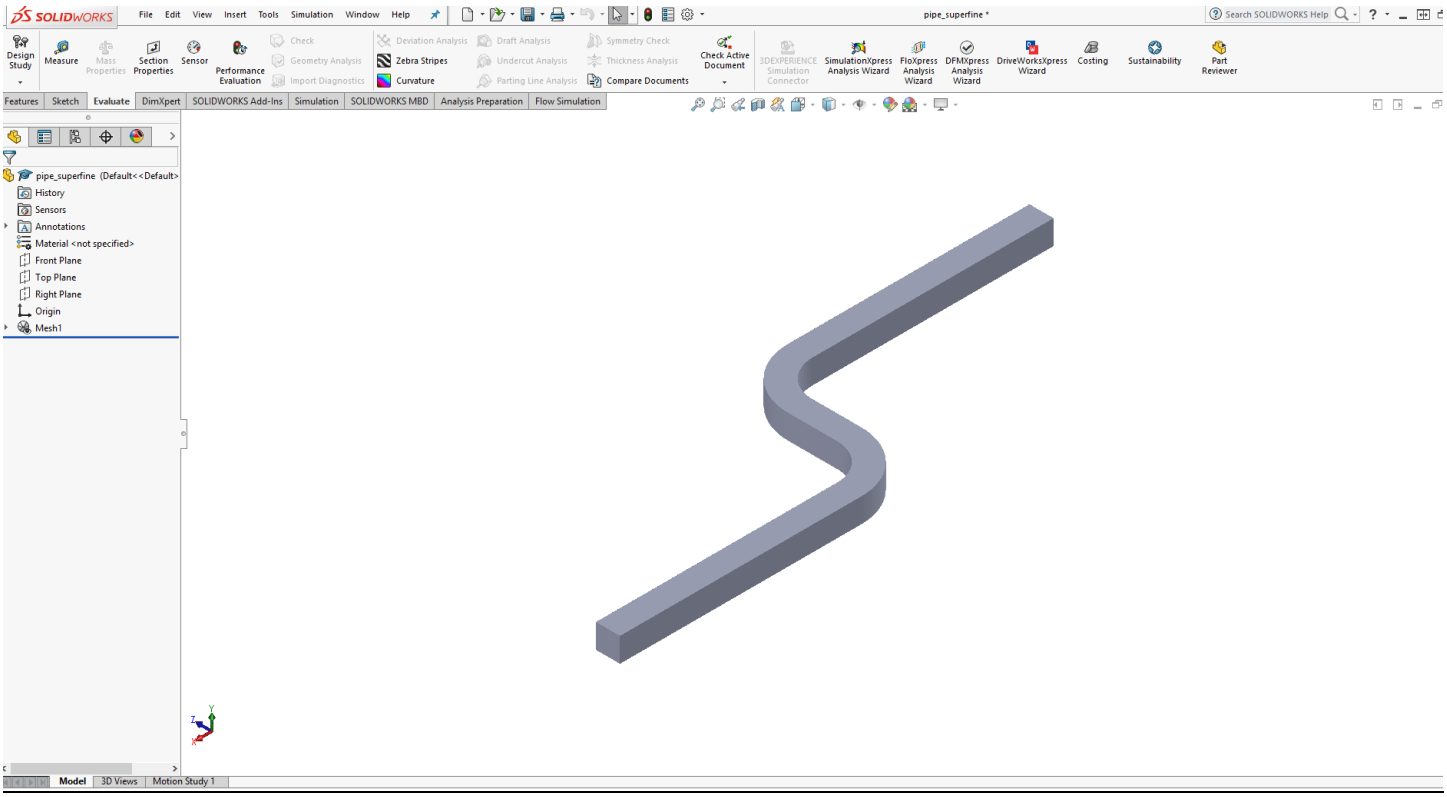


Task 6:

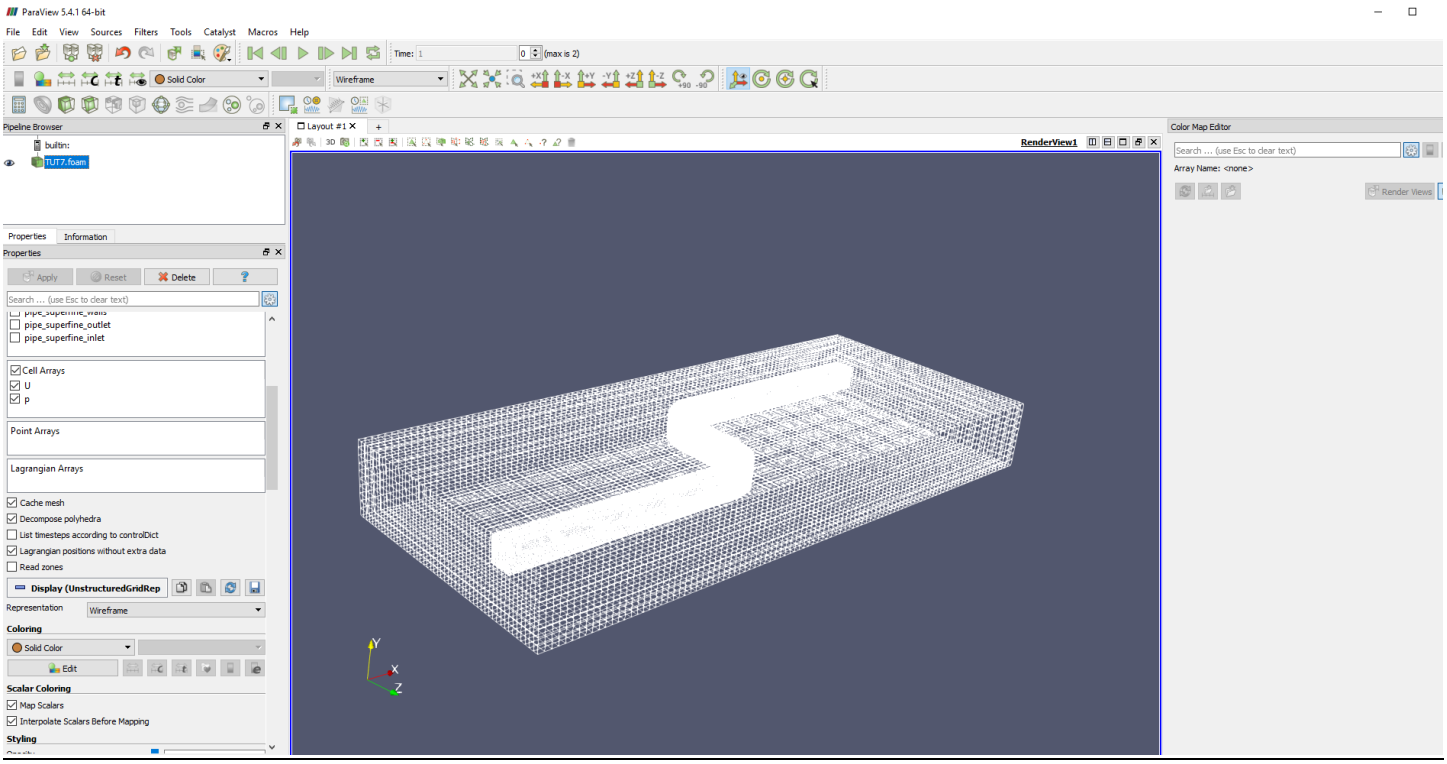
No Submission Required, but interesting!

Task 7:


ParaView 5.4.1 64-bit
File Edit View Sources Filters Tools Catalyst Macros Help
Pipeline Browser
builtin:
TUT6.foam
Properties Information
Apply Reset Delete
Decompose polyhedra
List timesteps according to controlDict
Lagrangian positions without extra data
Read zones
Display (UnstructuredGridRep
Representation Surface With Edges
Coloring
Solid Color
Edit
Scalar Coloring
Map Scalars
Interpolate Scalars Before Mapping
Styling
Opacity
Point Size
Line Width
Lighting
Interpolation Gouraud
Specular
Specular Color
Specular Power
Ambient
Diffuse
Edge Styling
Layout #1
RenderView1
Color Map Editor
Array Name: <none>


SOLIDWORKS
File Edit View Insert Tools Simulation Window Help
pipe_superfine *
Features Sketch Evaluate DimXpert SOLIDWORKS Add-Ins Simulation SOLIDWORKS MBD Analysis Preparation Flow Simulation
pipe_superfine (Default<<Default>
History
Sensors
Annotations
Material <not specified>
Front Plane
Top Plane
Right Plane
Origin
Mesh1
Model 3D Views Motion Study 1

Task 8:


ParaView 5.4.1 64-bit
File Edit View Sources Filters Tools Catalyst Macros Help
Pipeline Browser
builtin:
TUT7.foam
Properties Information
Properties
Apply Reset Delete
pipe_superfine_outlet
pipe_superfine_inlet
Cell Arrays
U
p
Point Arrays
Lagrangian Arrays
Cache mesh
Decompose polyhedra
List timesteps according to controlDict
Lagrangian positions without extra data
Read zones
Display (UnstructuredGridRep
Representation Wireframe
Coloring
Solid Color
Edit
Scalar Coloring
Map Scalars
Interpolate Scalars Before Mapping
Styling
Layout #1
RenderView1
Color Map Editor
Array Name: <none>
Render Views