ENERGY CATALYST – MID STAGE – ROUND 1
SWEPT 2
D3.3.01 CHARACTERIZATION OF DATA SOURCES
INNOVATE UK COMPETITION
PROJECT REFERENCE: 102239
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1 Manipulating VTK files with Paraview

This IPython notebook investigates the loading and manipulating of VTK files through use of the Paraview Python libraries.

1.1 Loading Paraview libraries

Paraview provides a Python shell **pvpython** which is setup with the necessary include paths to enable the use of the libraries. Through investigation of load orders and module load paths, the below was determined as the required approach to utilise the Paraview libraries in IPython.

```
In [1]: import sys
        sys.path = ["C:/Program Files/ParaView 4.4.0/lib/paraview-4.4/site-packages/",
                    "C:/Program Files/ParaView 4.4.0/lib/paraview-4.4/site-packages/vtk"
                   ] + sys.path
        import os
        os.environ['PATH'] = "C:\\Program Files\\ParaView 4.4.0\\bin;" + os.environ['PATH']
        import paraview.simple;

paraview version 4.4.0
```

1.2 Loading VTK files

The provided VTK files were presented as a set of partial meshes, the filenames were not intuitively chosen. Paraview GUI was used to interactively examine the files to find some suitable for beginning basic visualisation and manipulation investigations. The 4 files listed here were found referenced in a file **n0012_897_a0p0_4_0.pvtp**. An attempt to utilise a VTK file loader that deals with multi-part files failed, so:

```
In [2]: vtkDir = '../samples/CFD/n0012_897_a0p0_P12_OUTPUT'
        vtkFiles = [
            'n0012_897_a0p0_4_0_0.vtp',
            'n0012_897_a0p0_4_0_1.vtp',
            'n0012_897_a0p0_4_0_2.vtp',
            'n0012_897_a0p0_4_0_3.vtp'
```

```
        ]

        vtkFiles = [ '%s/%s'%(vtkDir,x) for x in vtkFiles ]
        vtkReaders = []
        for f in vtkFiles:
            vtkReader = paraview.simple.OpenDataFile( f )
            vtkReaders.append( vtkReader )
```

Several separate files must be grouped together into a single dataset:

```
In [3]: g = paraview.simple.GroupDatasets()
        g.Input = vtkReaders
```

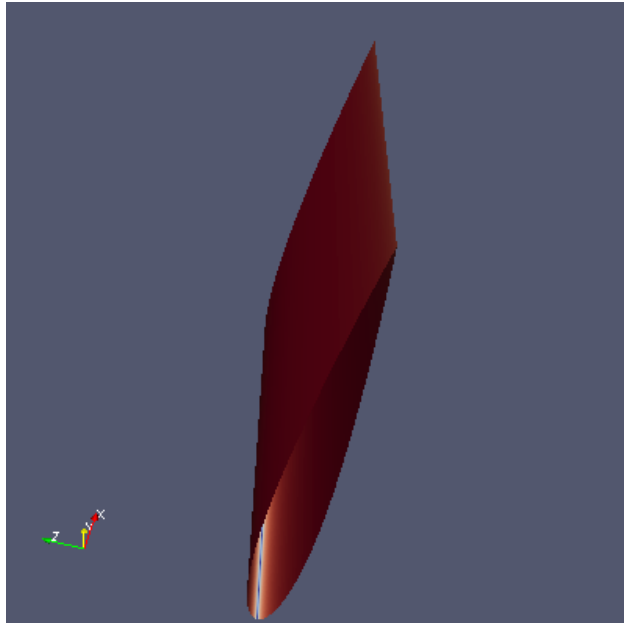Make sure that a surface representation will be plotted:

```
In [4]: paraview.simple.Show(g)
        paraview.simple.SetDisplayProperties(vtkReader, Representation='Surface')
```

Put the camera somewhere interesting and save a screenshot:

```
In [5]: cam = paraview.simple.GetActiveCamera()
        cam.SetPosition(1.4721964184224252, -2.279991281731778, 0.4211363870288759)
        paraview.simple.Render();
        paraview.simple.SaveScreenshot('NACA0012.png');
```

```
In [6]: from IPython.display import Image
        Image(filename='NACA0012.png')
```

Out[6]:


```
In [ ]:
```