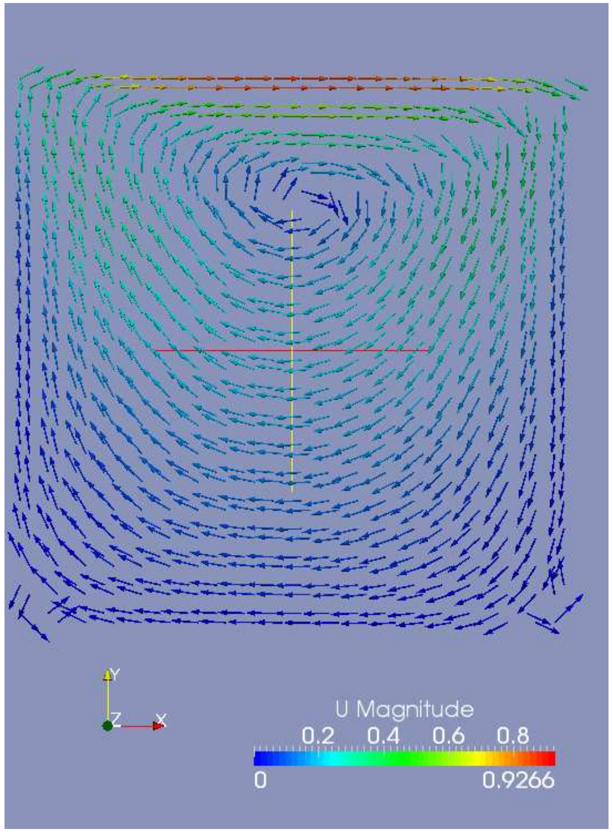
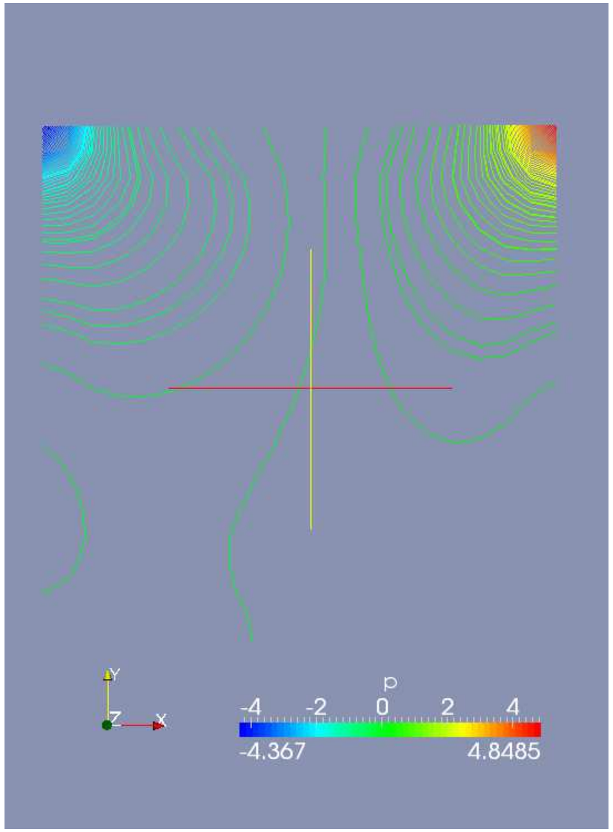
icoFoam: cavity Case

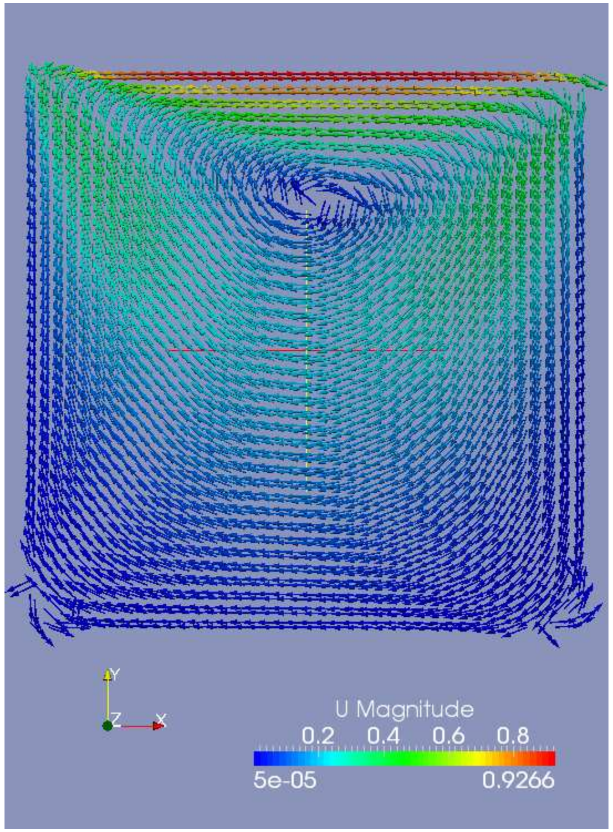
Left: in the plane normal to Z axis, there are shown the U vectors of the flow in the block domain using the Slice, Cell centers and Gliph filters. Right: in the same plane created before, there are shown the contour lines for a determined range of pressures using the Countour filter.

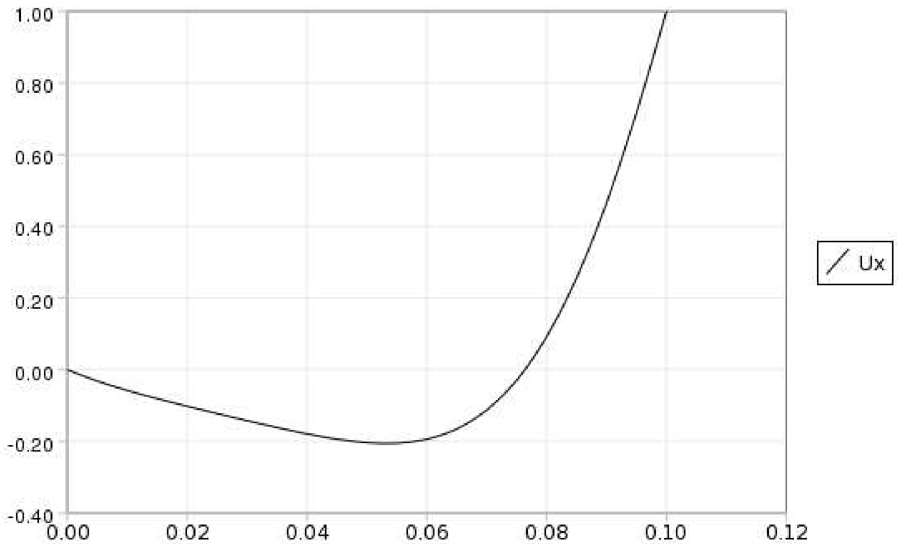




icoFoam: cavityFine Case

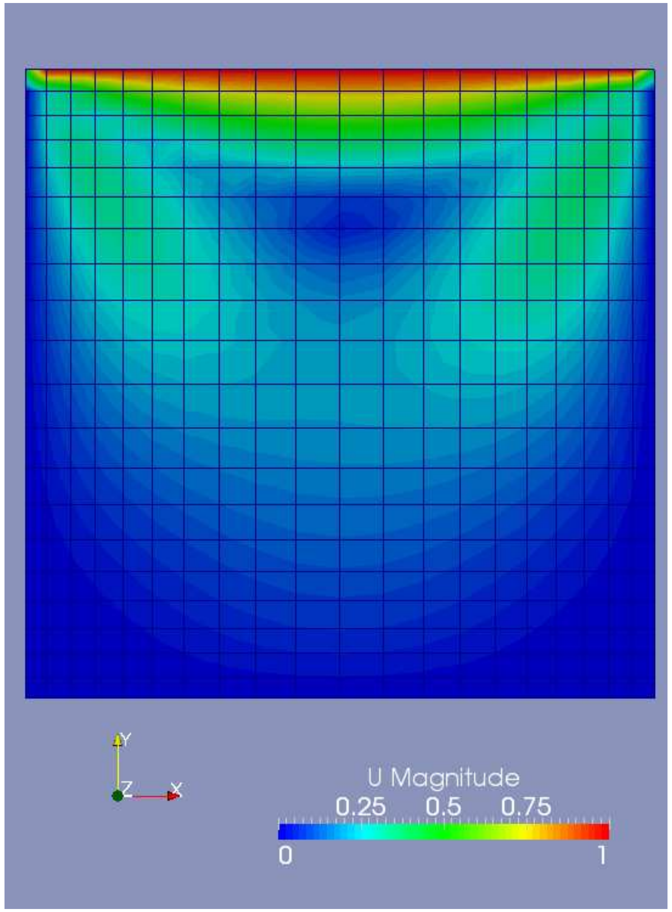
Right: in the plane defined before, there are shown again the U vectors from the cell centers. Left: the values of Ux are plotted against y position in the block domain; this has been done by defining a line using the filter Plot Over Line.





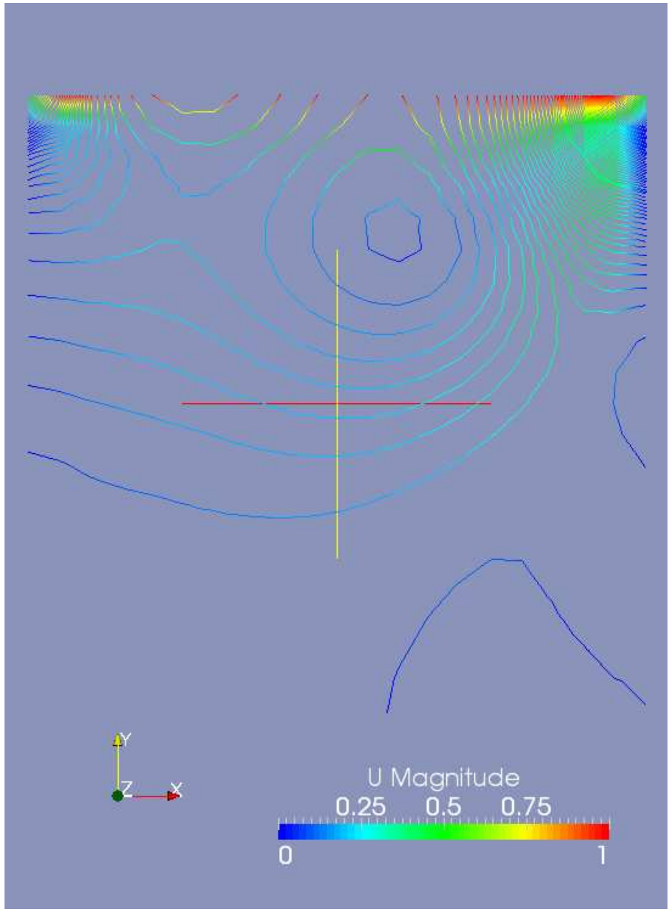
icoFoam: cavityGrade Case

In the figure below, it is shown the U surface with edges in order to be able to see the graded mesh.



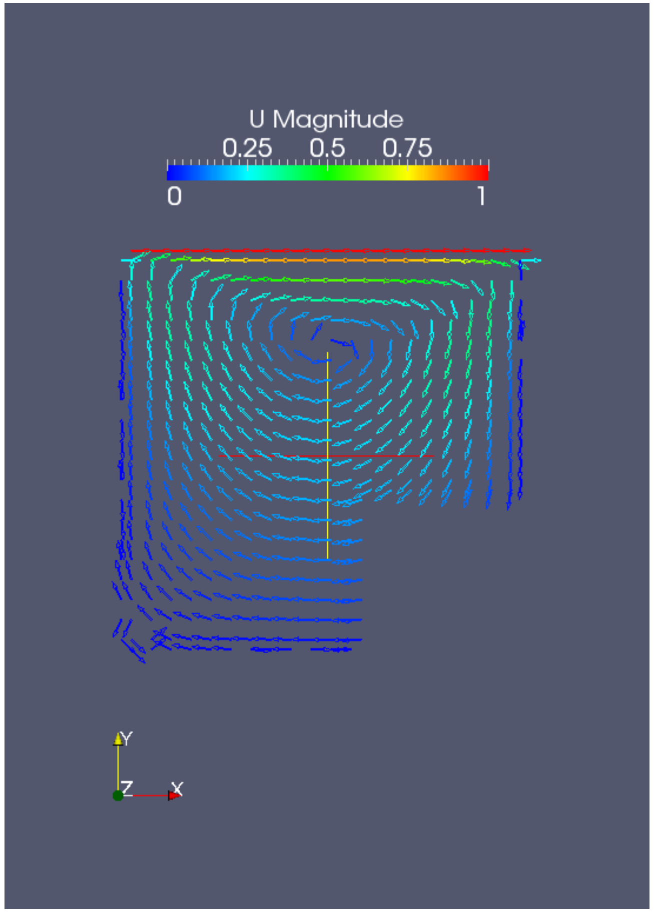
icoFoam: cavityHighRe Case

There are shown for different p lines the U values; that has been done by using the Slice filter (plane normal to Z vector) and the Contour filter (by p showing U).



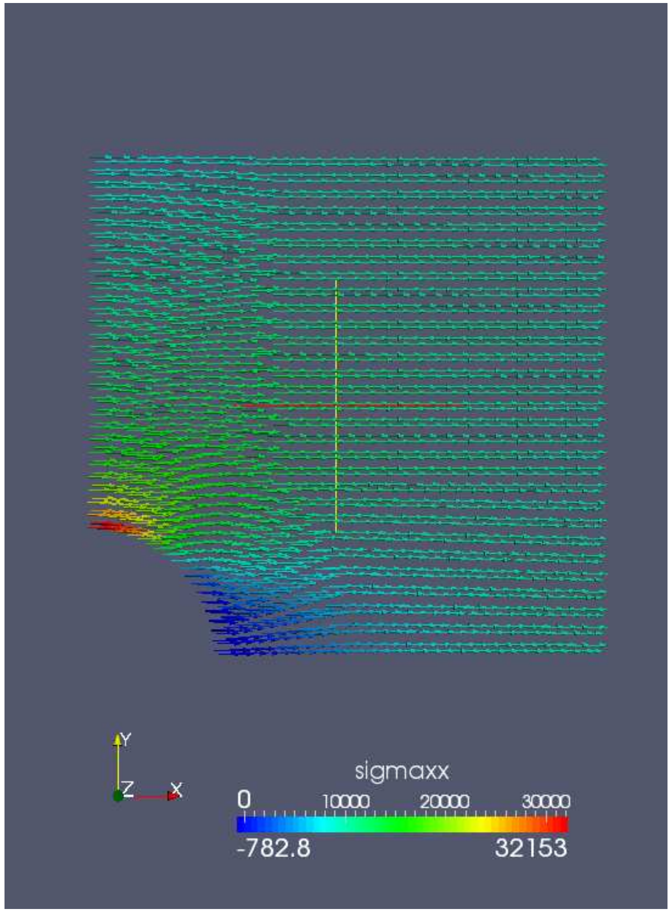
icoFoam: cavityClipped Case

There are shown the U vectors in the clipped geometry.



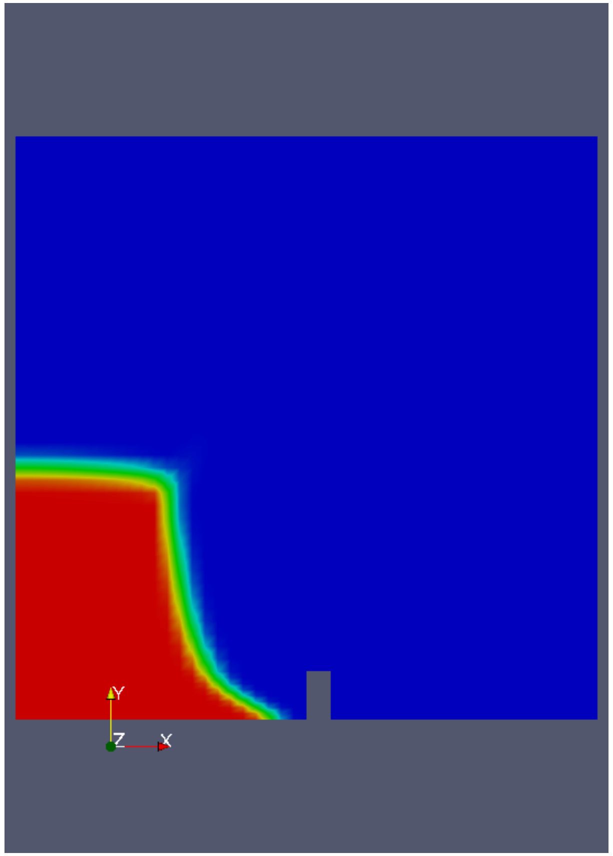
solidDisplacementFoam: plateHole Case

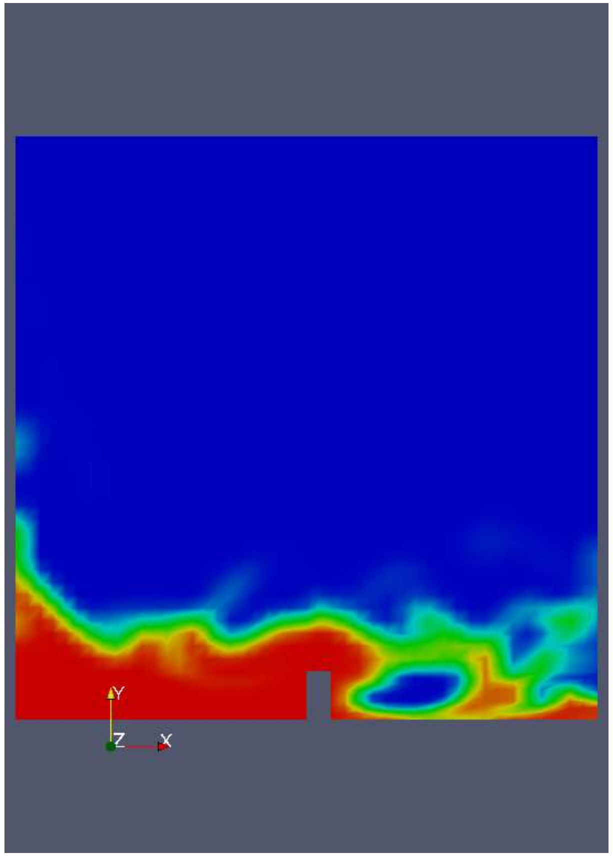
There are shown the tension vector values from X direction in the plane Z of the plate with a hole; that has been done using the Slice, the Cell Centers and the Glyph filters.



interFoam/laminar: damBreak Case

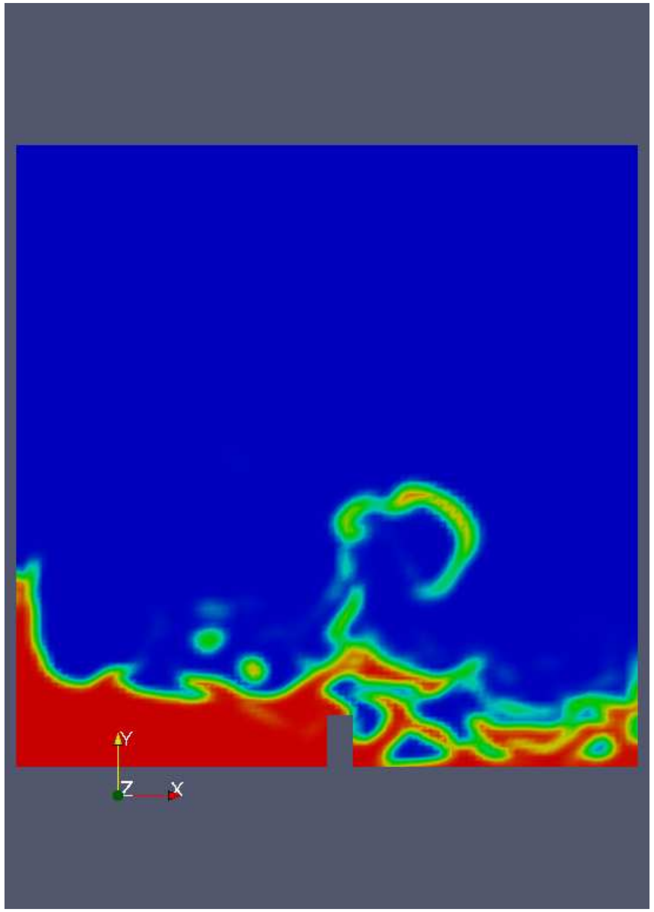
Left: it is shown the alpha value at 0.1s from the beginning in the plane Z. That is done by choosing the proper time and using the Slice filter. Right: the same at 1s in order to see how it has changed.





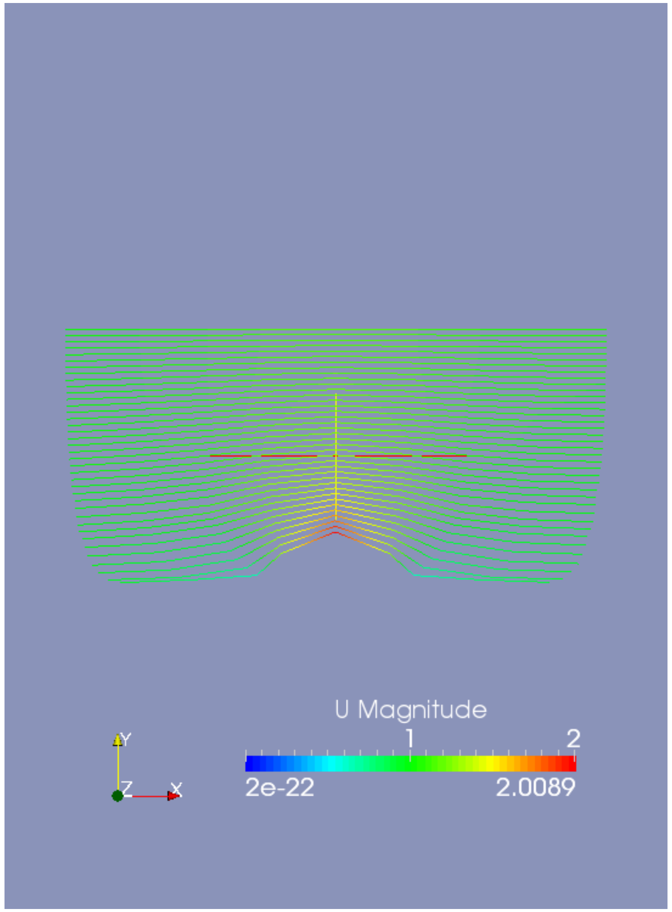
interFoam/laminar: damBreakFine Case

It is shown, in the same way as before, at 1s and then it can be seen how there is more precision due to the fine mesh defined in this case.



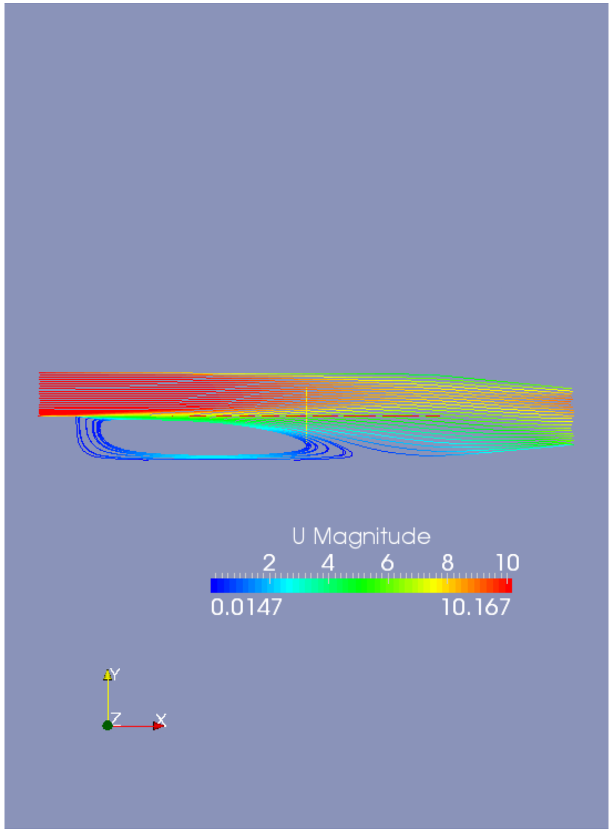
potentialFoam: cylinder Case

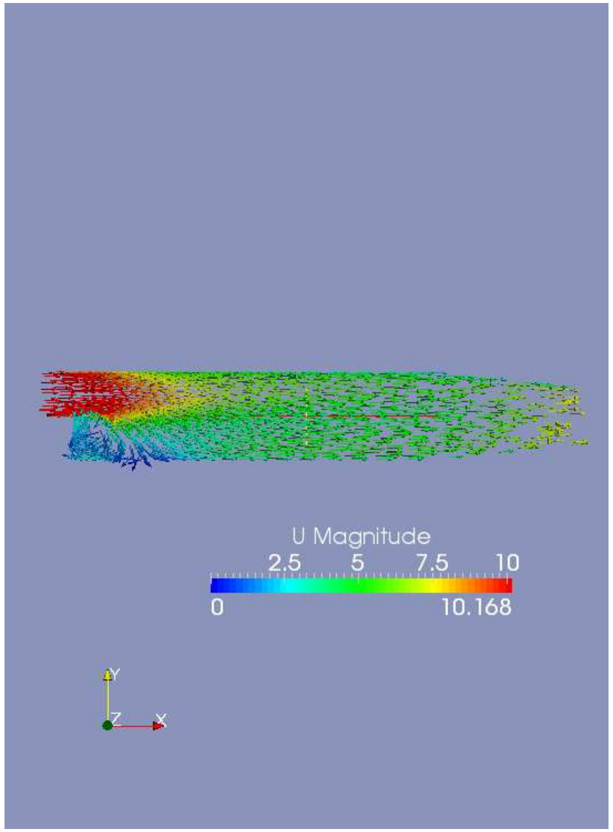
There are shown the U streamlines of the potential flow through a line, this is done by using the Stream Tracer filter.



simpleFoam: pitzDaily Case

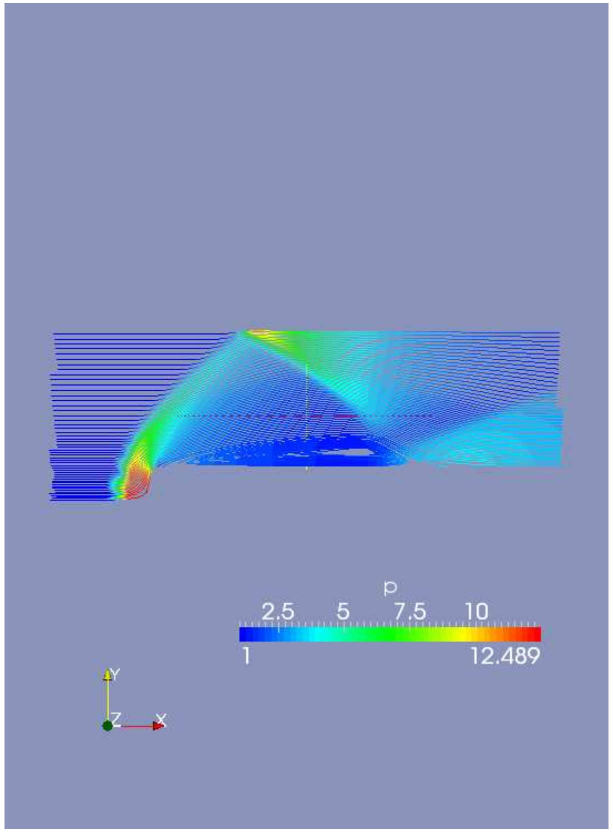
Left: there are shown the U streamlines at the last iteration of the case; this is done by choosing the last step time and using the Stream Tracer filter. Right: to see how U has been changed from the beginning, the figure shows U vectors after the first time step.

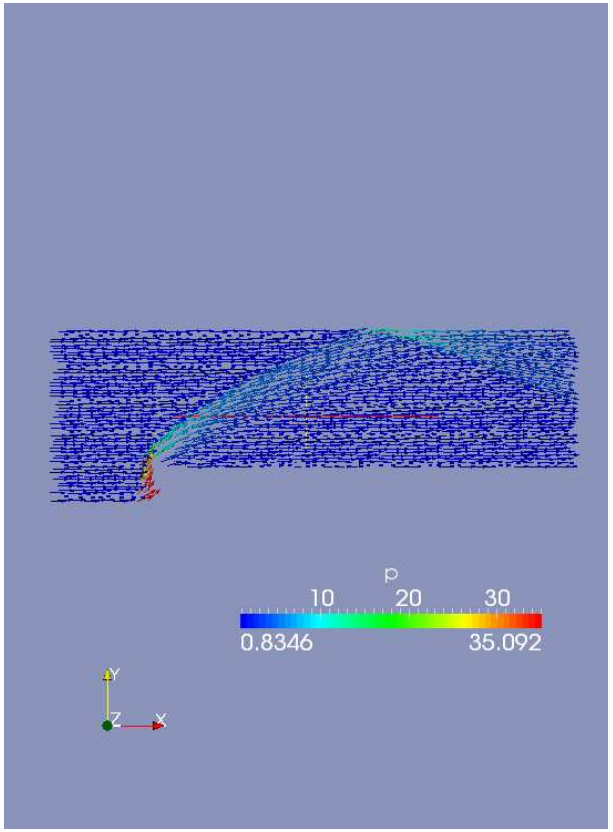




sonicFoam: forwardStep Case

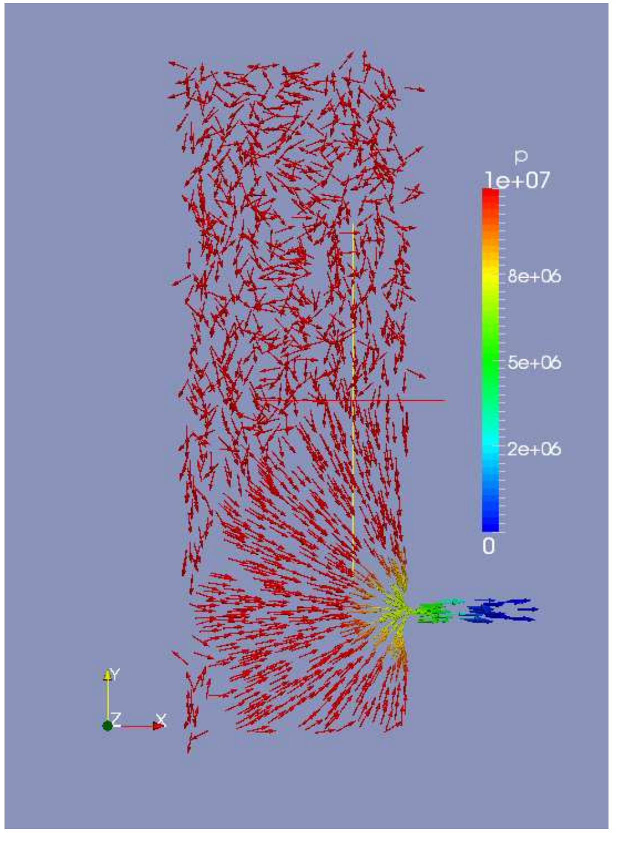
Left: in order to see the pressure wave it is shown the p streamlines using the Stream Tracer Filter through a line defined in Y axis. Right: for a change in the speed, now is Mach 5, it can be seen that the p wave profile is changed; in this picture, that is shown by plotting the p vectors in plane Z from the center of the cells.

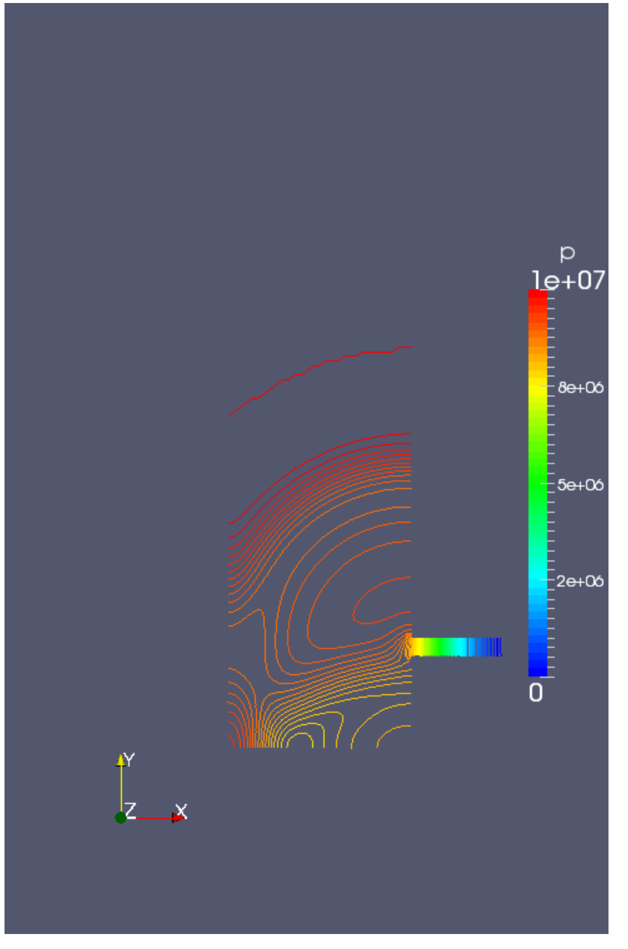




sonicLiquidFoam: decompressionTank Case

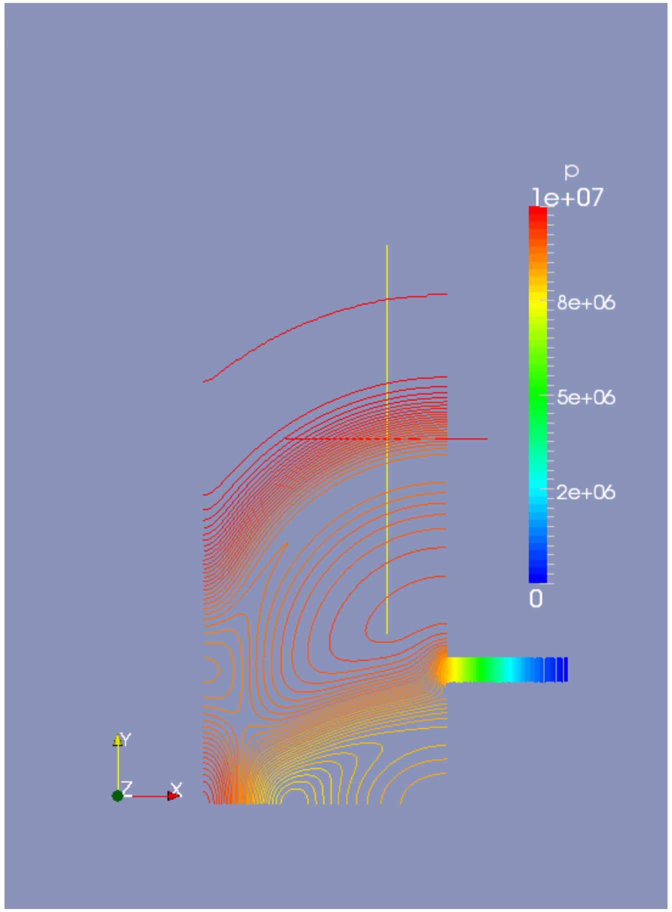
Left: at the 5th step time, there are shown the p vectors centred in the cells. Right: at the last step, showing the the p lines.





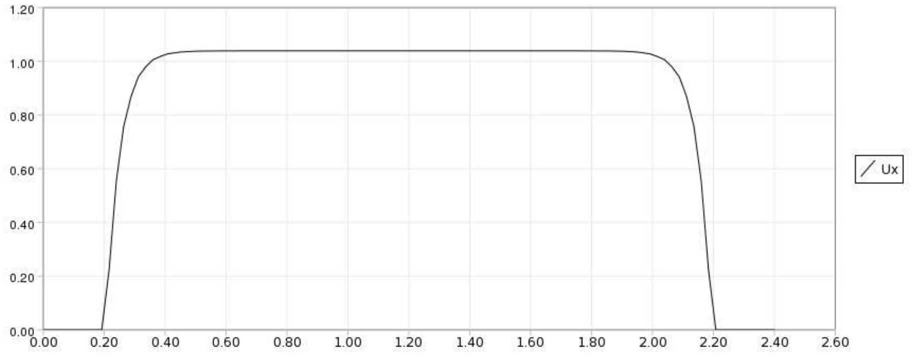
sonicLiquidFoam: decompressionTankFine Case

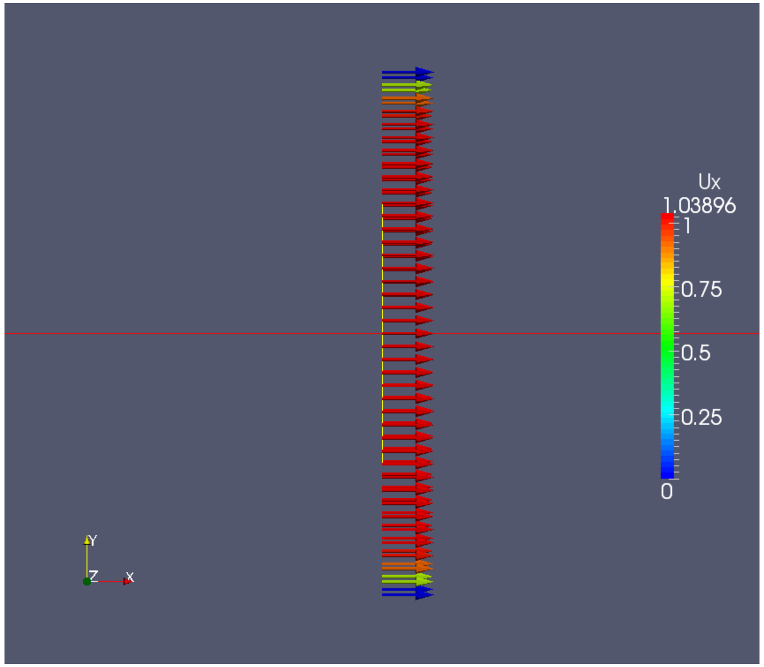
There are shown the p lines using the Contour filter (countored by p).



mhdFoam: hartmann Case

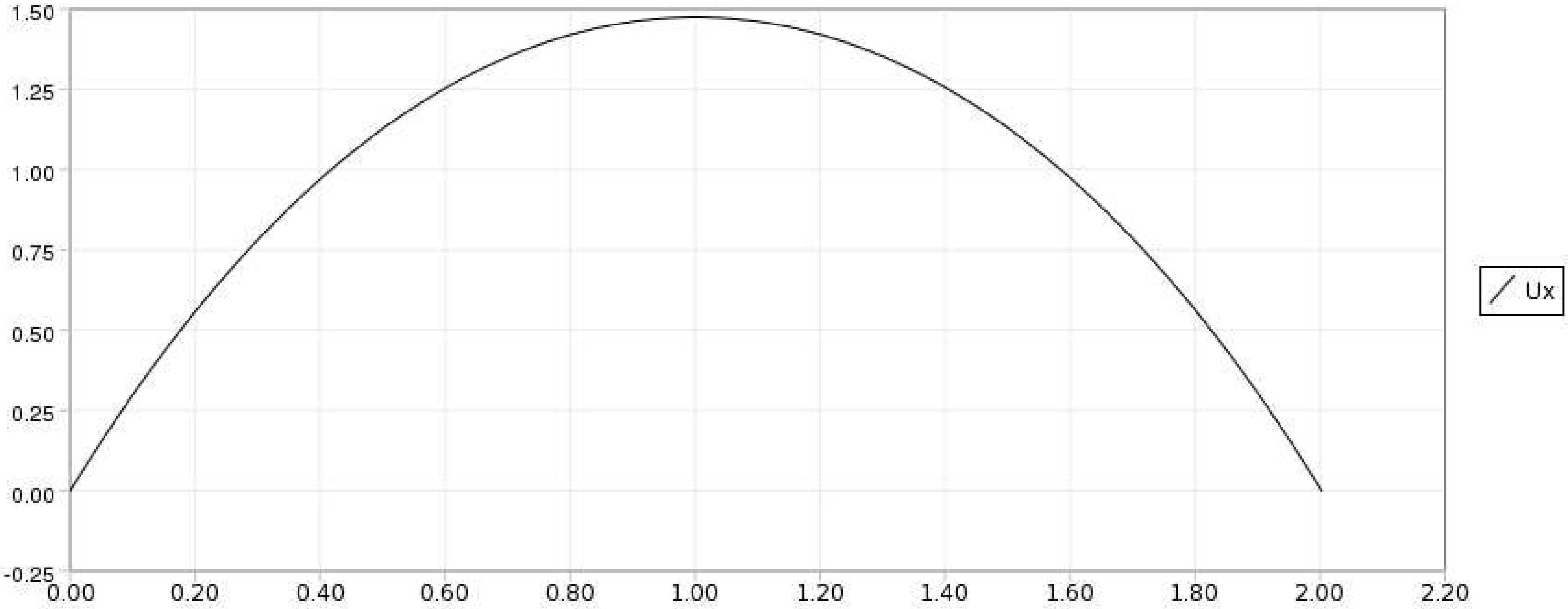
Left: there is shown the plot of Ux depending in the Y direction. This is done by Plot Over Line filter. Right: the Ux profile is also shown in the right figure by plotting the X vector values in the surface of the plane X.





mhdFoam: hartmannChange Case

If B value is changed from 20 to 1, the Ux profile obtained is the next one.



solidDisplacementFoam: aqueduct Case

The aqueduct Case is a modification of the plateHole one in order to study the load of the water on it. To do that the geometry and the mesh has been changed, therefore, blockMeshDict is the following one:

```
vertices
(
    (0.5 0 0)
    (0.75 0 0)
    (0.8 0 0)
    (0.8 0.53033 0)
    (0.53033 0.53033 0)
    (0.353553 0.353553 0)
    (0.8 0.8 0)
    (0.53033 0.8 0)
    (0 0.8 0)
    (0 0.75 0)
    (0 0.5 0)
    (0.5 0 0.5)
    (0.75 0 0.5)
    (0.8 0 0.5)
```

solidDisplacementFoam: aqueduct Case

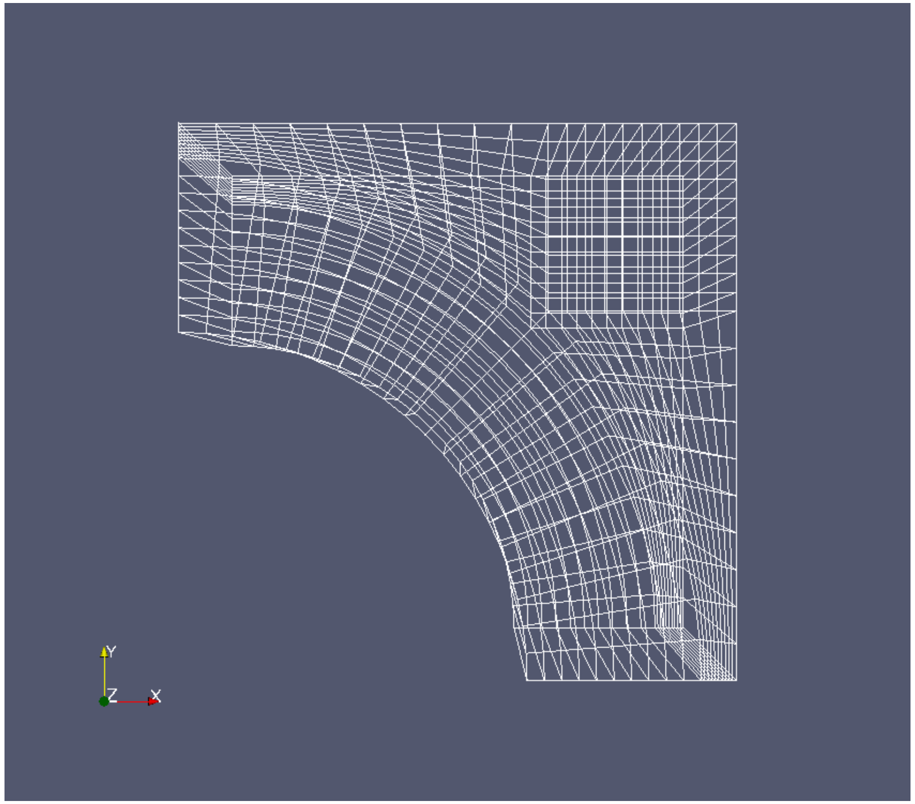
```
    (0.8 0.53033 0.5)
    (0.53033 0.53033 0.5)
    (0.353553 0.353553 0.5)
    (0.8 0.8 0.5)
    (0.53033 0.8 0.5)
    (0 0.8 0.5)
    (0 0.75 0.5)
    (0 0.5 0.5)
);

blocks
(
    hex (5 4 9 10 16 15 20 21) (10 10 1) simpleGrading (2 1 1)
    hex (0 1 4 5 11 12 15 16) (10 10 1) simpleGrading (2 1 1)
    hex (1 2 3 4 12 13 14 15) (4 10 1) simpleGrading (1 1 1)
    hex (4 3 6 7 15 14 17 18) (4 4 1) simpleGrading (1 1 1)
    hex (9 4 7 8 20 15 18 19) (4 10 1) simpleGrading (1 1 1)
);
```

solidDisplacementFoam: aqueduct Case

```
edges
(
    arc 0 5 (0.469846 0.17101 0)
    arc 5 10 (0.17101 0.469846 0)
    arc 1 4 (0.66747 0.34202 0)
    arc 4 9 (0.34202 0.66747 0)
    arc 11 16 (0.469846 0.17101 0.5)
    arc 16 21 (0.17101 0.469846 0.5)
    arc 12 15 (0.66747 0.34202 0.5)
    arc 15 20 (0.34202 0.66747 0.5)
);
```

solidDisplacementFoam: aqueduct Case

Once the changes are done, the resulting mesh and geometry is the shown in the next picture:



The small arc has a radius of 0.5m, the bigger one 0.75m, the complete height and length are 0.8m and the width is 0.5; it is a scale 1:10.

solidDisplacementFoam: bridge Case

The uniform compression to which the aqueduct is loaded having a half meter flow of water is 4905 Pa (due to the scale of the size, the scaled uniform compression value is of 4,905 Pa). This has to be changed in the 0/D file, as shown:

```
boundaryField
{
    left
    {
        type                symmetryPlane;
    }
    right
    {
        type                tractionDisplacement;
        traction            uniform ( -4.905 0 0 );
        pressure            uniform 0;
        value               uniform (0 0 0);
    }
```

solidDisplacementFoam: bridge Case

The results of displacement and stress are shown in the following pictures: