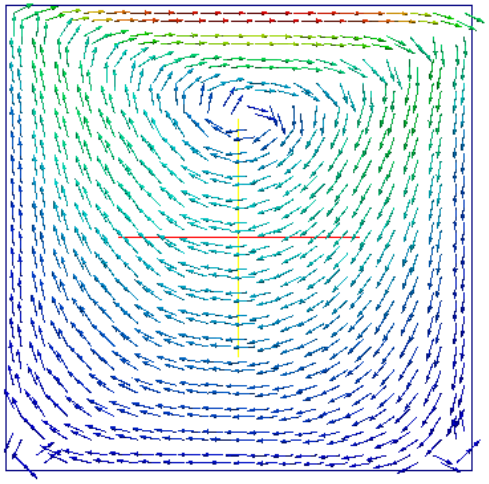
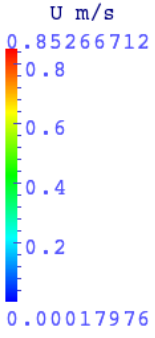
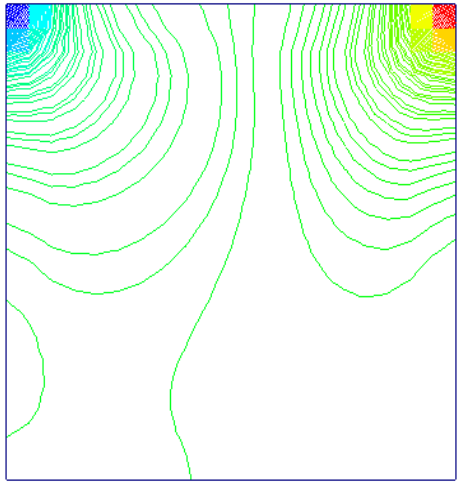
icoFoam : Cavity

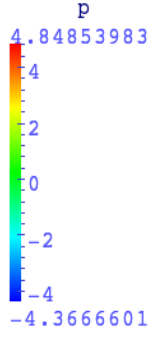




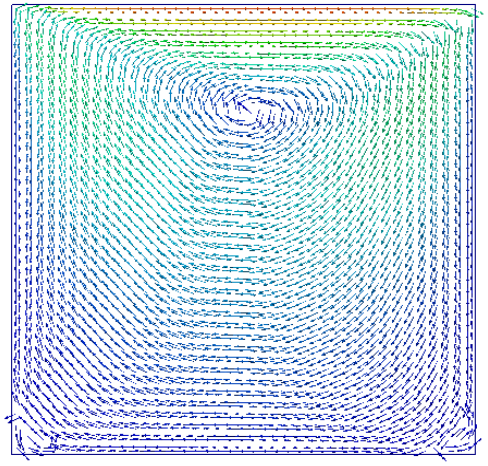
'Slice' filter and velocity glyph at cell centres on coarse mesh.

Pressure contours .



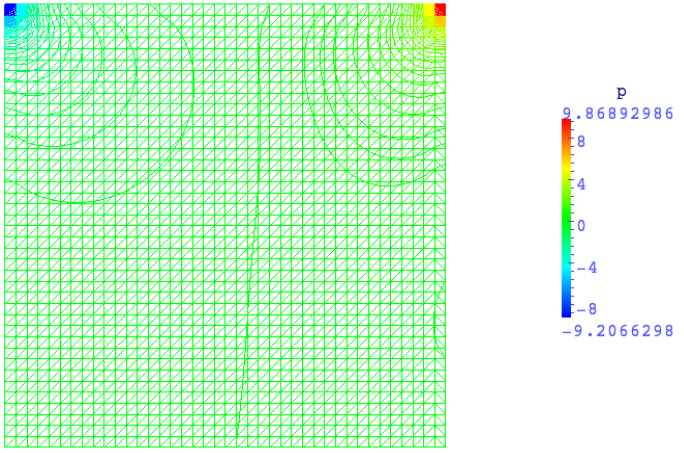


icoFoam : CavityFine

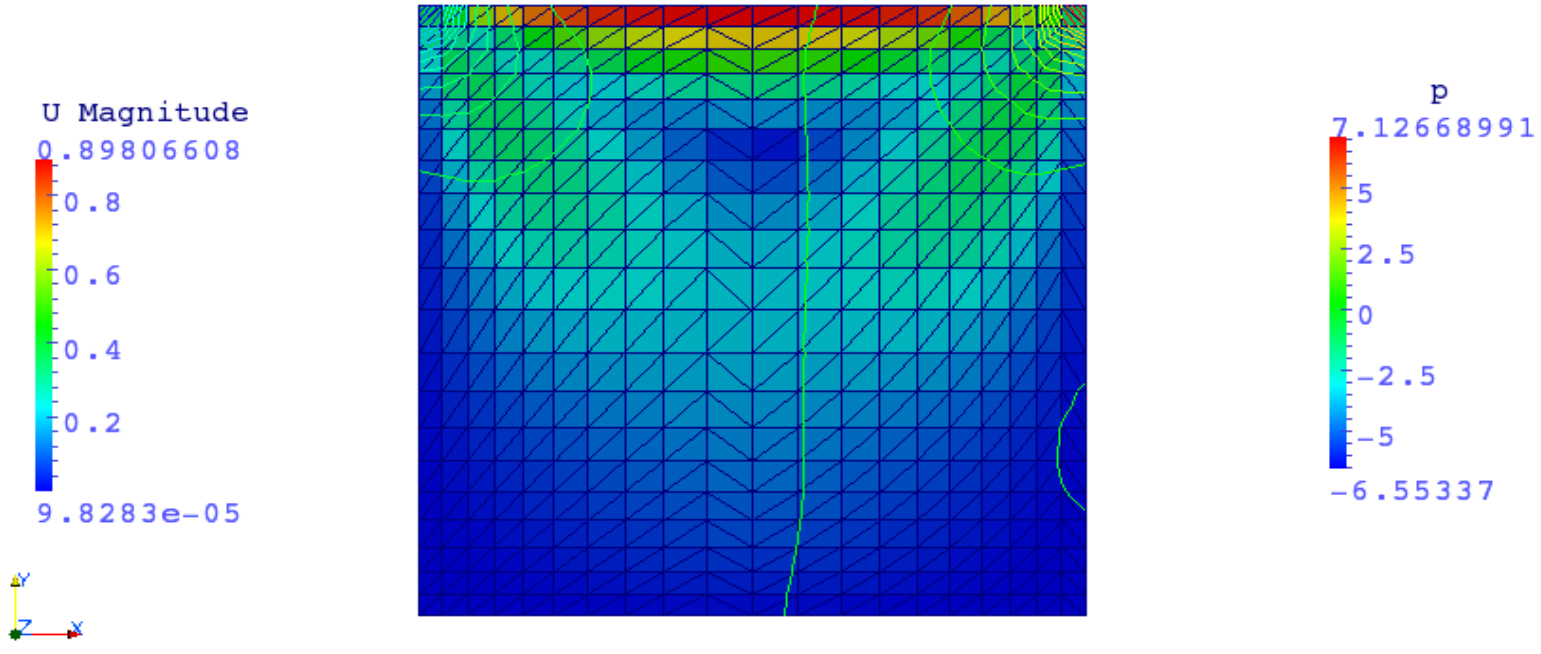


Velocity glyph at cell centres on fine mesh

Pressure contours and mesh resolution

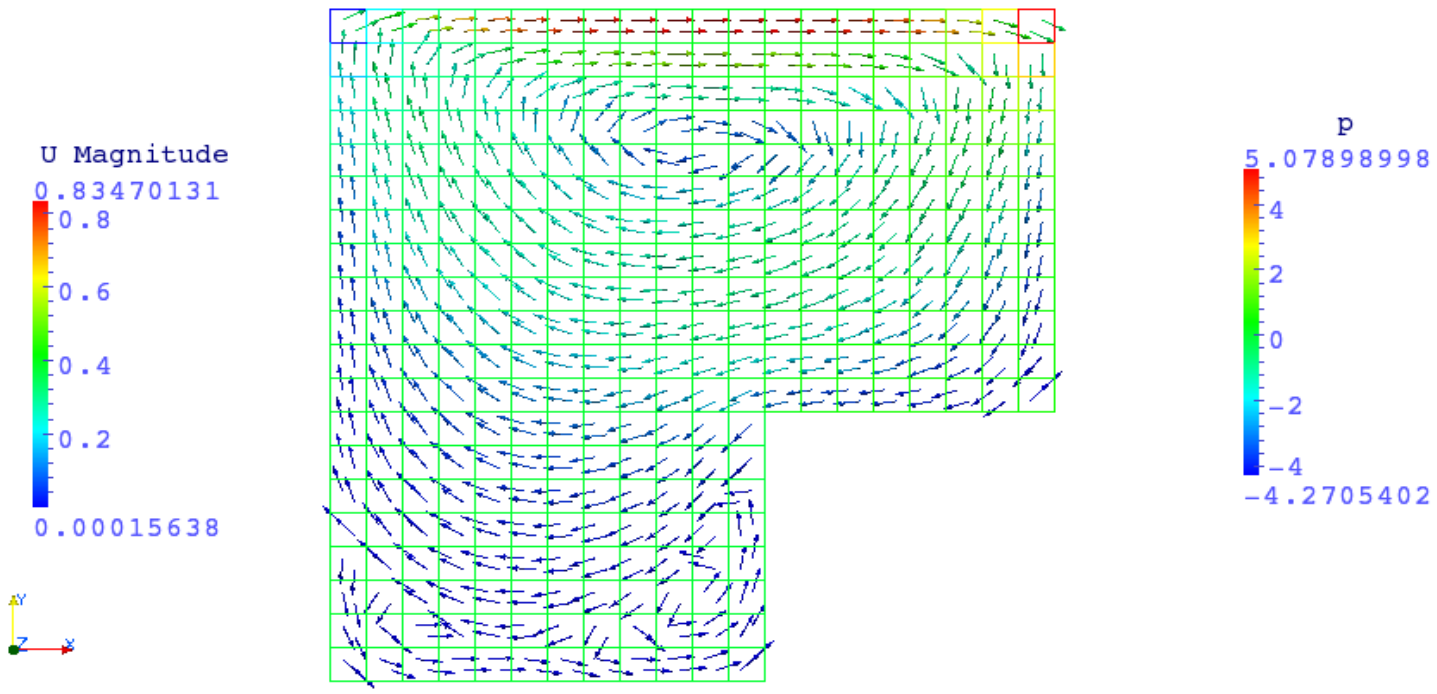


icoFoam : CavityGrade



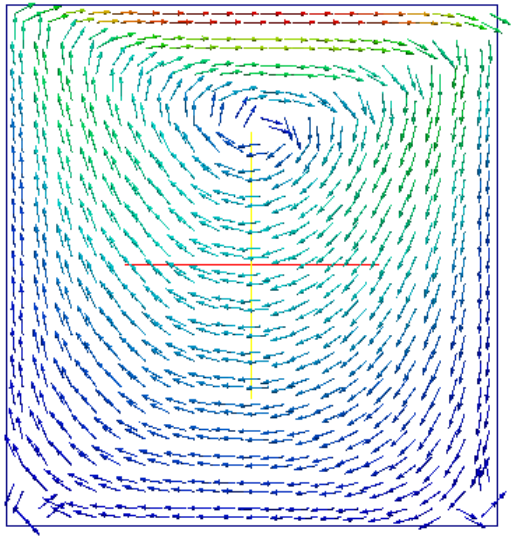
- Graded mesh. Finer in regions of higher activity.
- Slice filter and pressure contours.

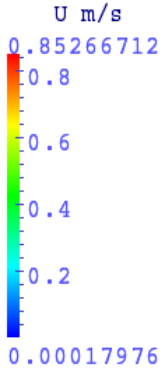
IcoFoam : CavityClip

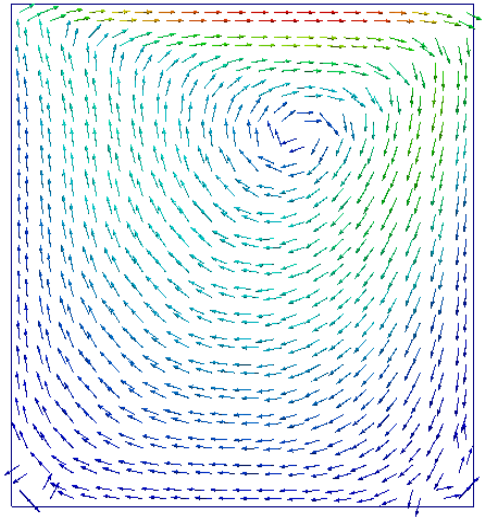


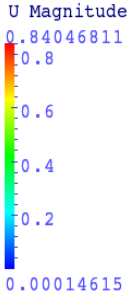
- Velocity glyph at cell centres on the clipped domain.
- Wireframe coloured by pressure.

icoFoam : CavityHighRe







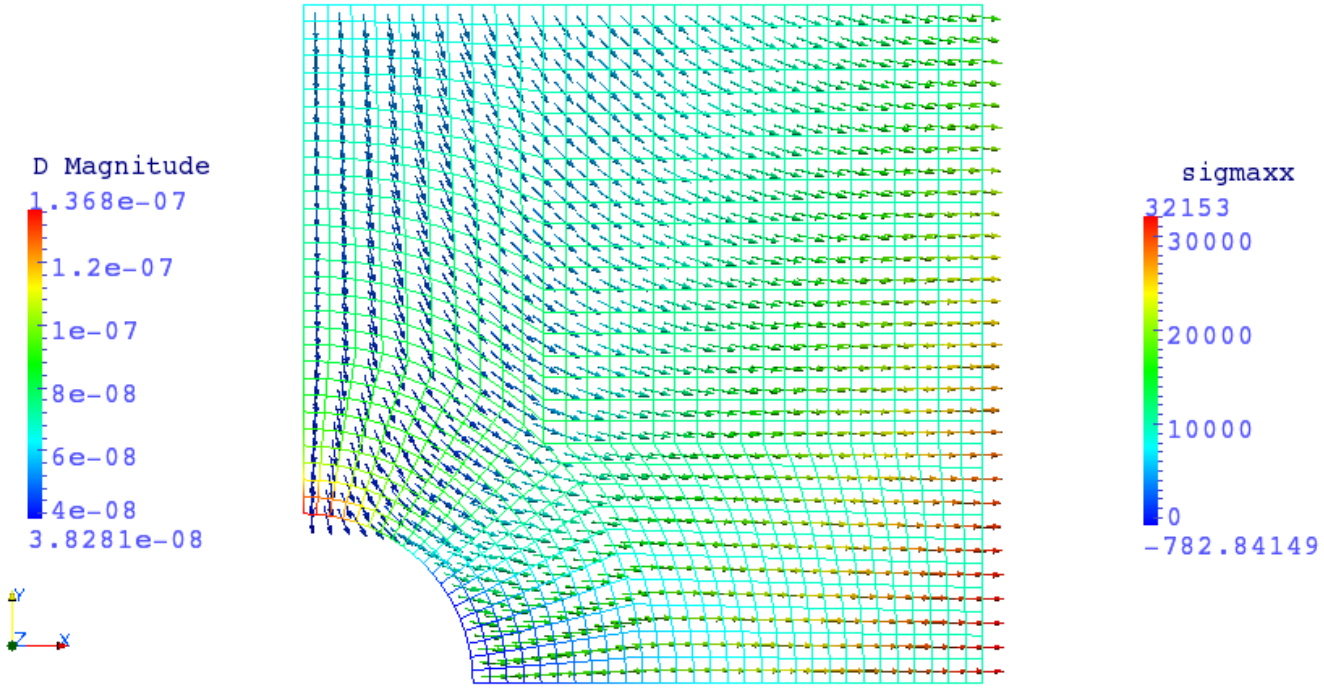


Lower Re

Higher Re

Slice filter and velocity glyph at cell centres.

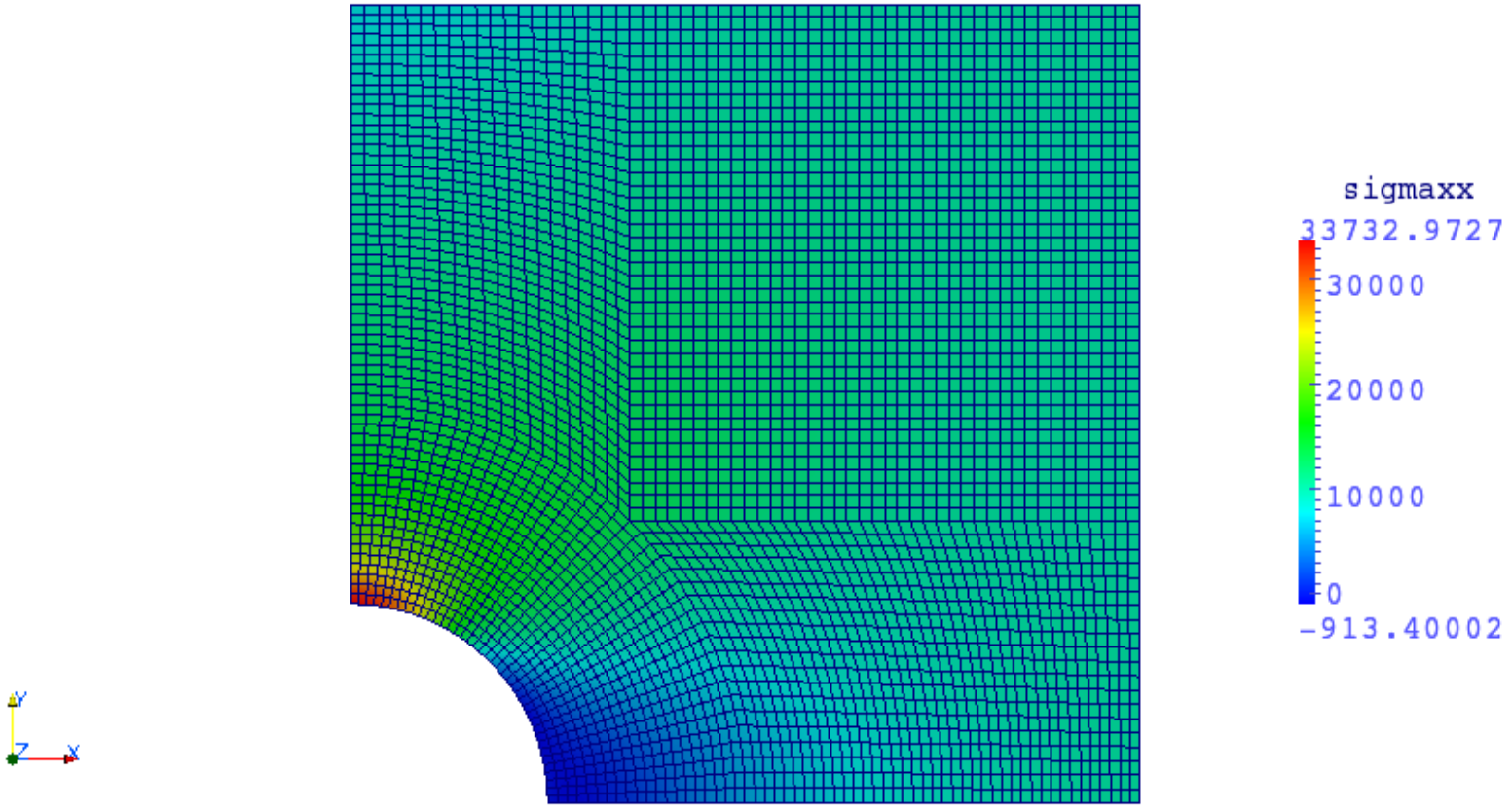
solidDisplacementFoam : plateHole

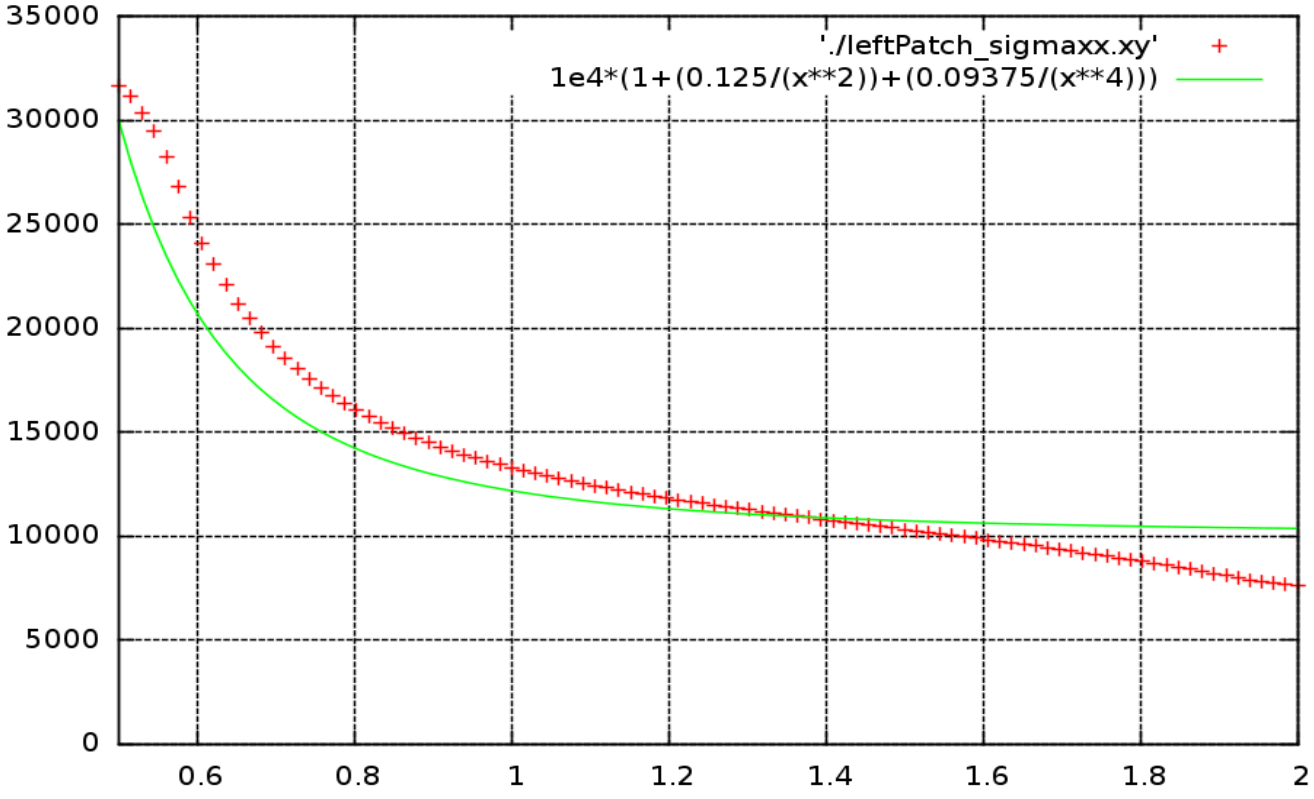


•Due to horizontal and vertical symmetry, a quarter of the infinite plate is considered.

•Wireframe colouring is by sigmaxx and displacement glyph on cell centres is plotted.

solidDisplacementFoam : plateHoleFine





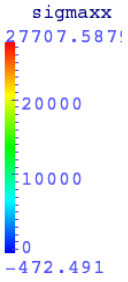
- Plot of sigmaxx on the left patch.
- Green represents the analytical solution and red, the numerical solution. The latter is not a good approximation.

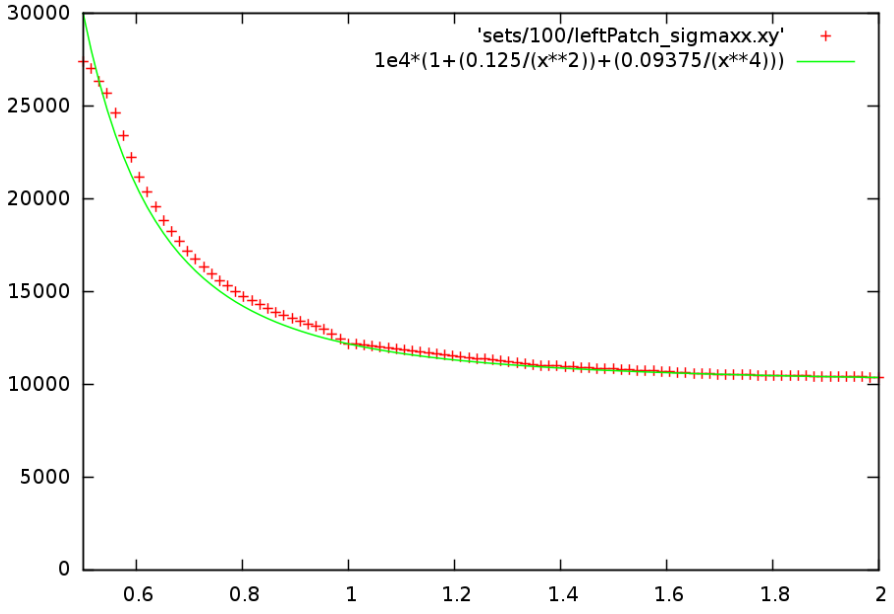
solidDisplacementFoam : plateHoleLarge

```
convertToMeters 1;

vertices
(
    (0.5 0 0)
    (1 0 0)
    (8 0 0)
    (8 0.707107 0)
    (0.707107 0.707107 0)
    (0.353553 0.353553 0)
    (8 8 0)
    (0.707107 8 0)
    (0 8 0)
    (0 1 0)
    (0 0.5 0)
    (0.5 0 0.5)
    (1 0 0.5)
    (8 0 0.5)
    (8 0.707107 0.5)
    (0.707107 0.707107 0.5)
    (0.353553 0.353553 0.5)
    (8 8 0.5)
    (0.707107 8 0.5)
    (0 8 0.5)
    (0 1 0.5)
    (0 0.5 0.5)
);
```

- The *blockMeshDict* is edited to increase length of plate by 4 times keeping the hole diameter constant.

solidDisplacementFoam : plateHoleLarge





Thus the numerical solution gives a better approximation.

solidDisplacementFoam : plateHoleSquare (an interesting change)

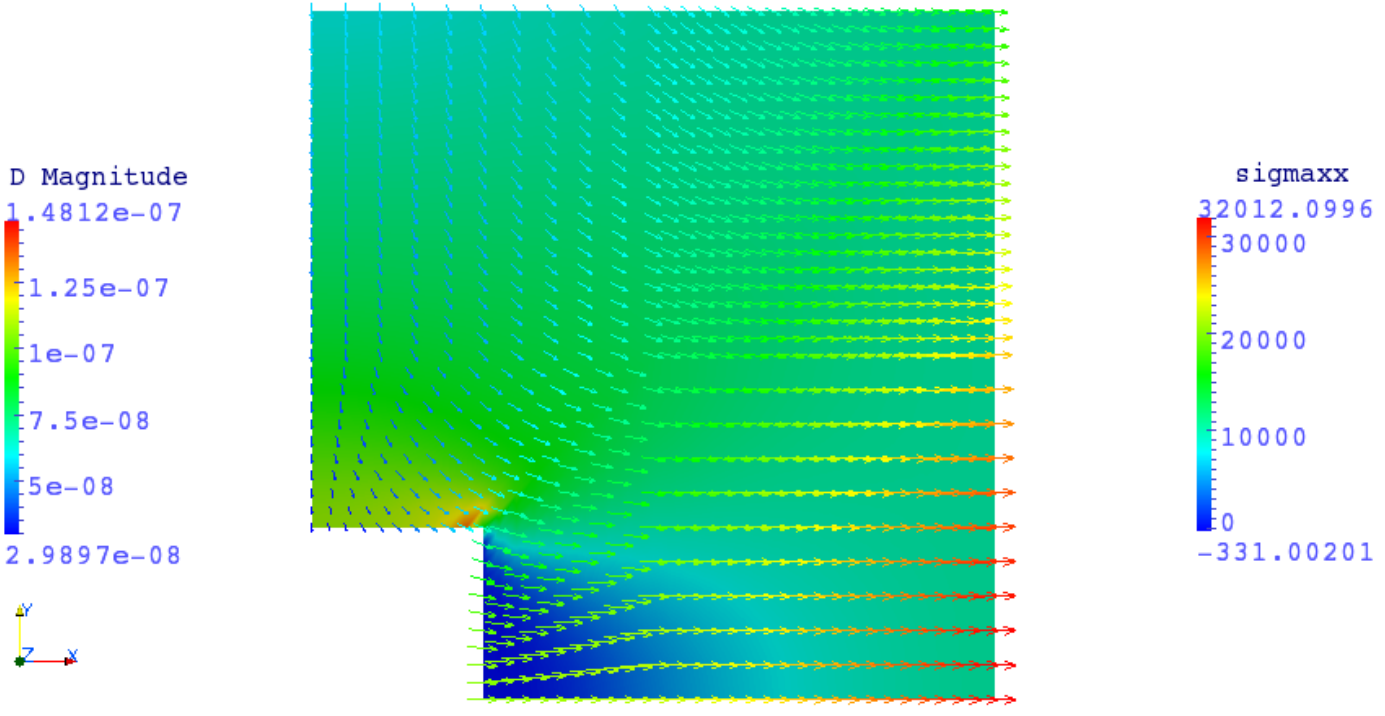
```
convertToMeters 1;

vertices
(
    (0.5 0 0)
    (1 0 0)
    (2 0 0)
    (2 1 0)
    (1 1 0)
    (0.5 0.5 0)
    (2 2 0)
    (1 2 0)
    (0 2 0)
    (0 1 0)
    (0 0.5 0)
    (0.5 0 0.5)
    (1 0 0.5)
    (2 0 0.5)
    (2 1 0.5)
    (1 1 0.5)
    (0.5 0.5 0.5)
    (2 2 0.5)
    (1 2 0.5)
    (0 2 0.5)
    (0 1 0.5)
    (0 0.5 0.5)
);
```

- The *blockMeshDict* is edited to form a square hole in this case.

- The 'edges' block is disabled:

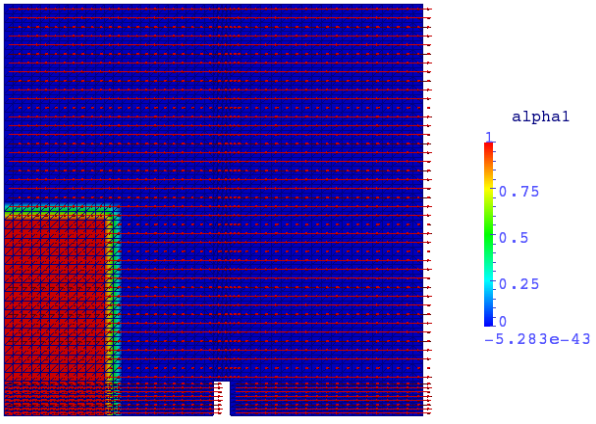
```
/*edges
(
    arc 0 5 (0.469846 0.17101 0)
    arc 5 10 (0.17101 0.469846 0)
    arc 1 4 (0.939693 0.34202 0)
    arc 4 9 (0.34202 0.939693 0)
    arc 11 16 (0.469846 0.17101 0.5)
    arc 16 21 (0.17101 0.469846 0.5)
    arc 12 15 (0.939693 0.34202 0.5)
    arc 15 20 (0.34202 0.939693 0.5)
);*/
```

solidDisplacementFoam : plateHoleSquare

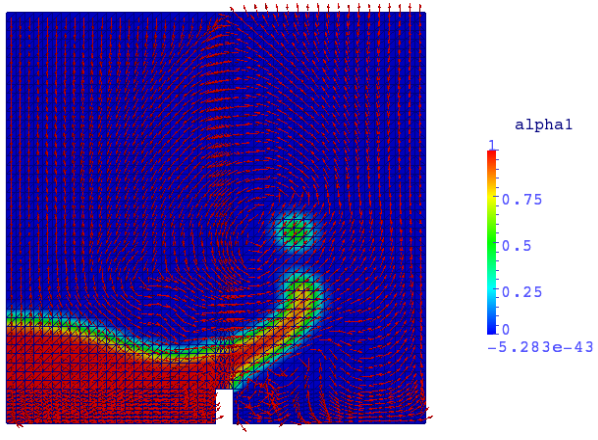


- The displacement glyphs and sigmaxx is as shown.
- The region of stress concentration has moved away from the axis of the plate.

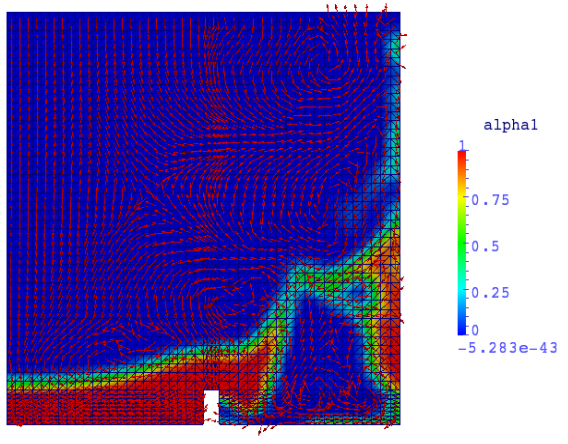
interFoam : damBreak



$t=t_0$



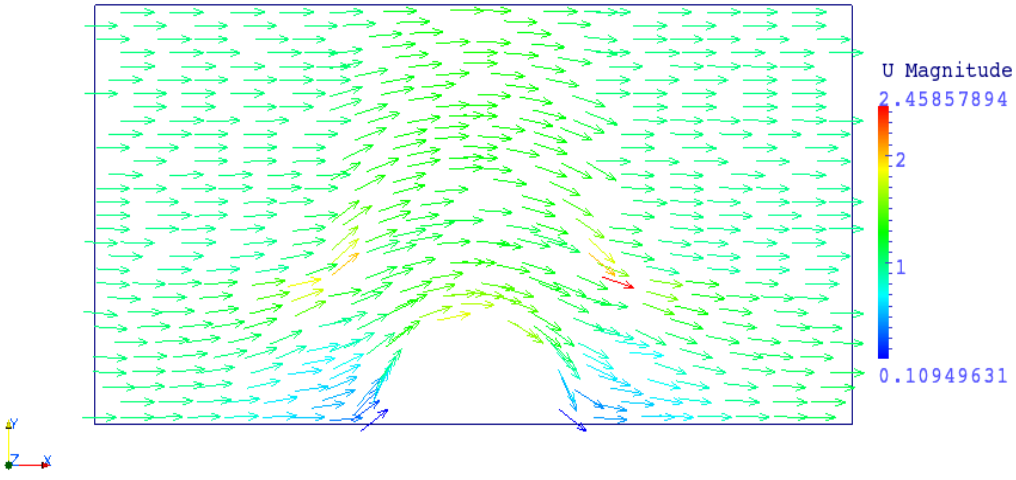
t=0.25s



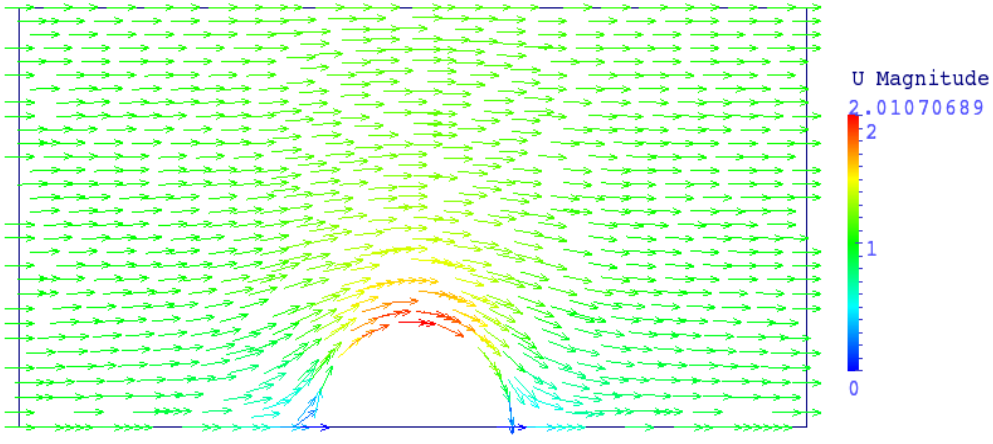
t=0.5s

Surface plots of volume-fraction 'α' and velocity glyphs are plotted.

potentialFoam : cylinder

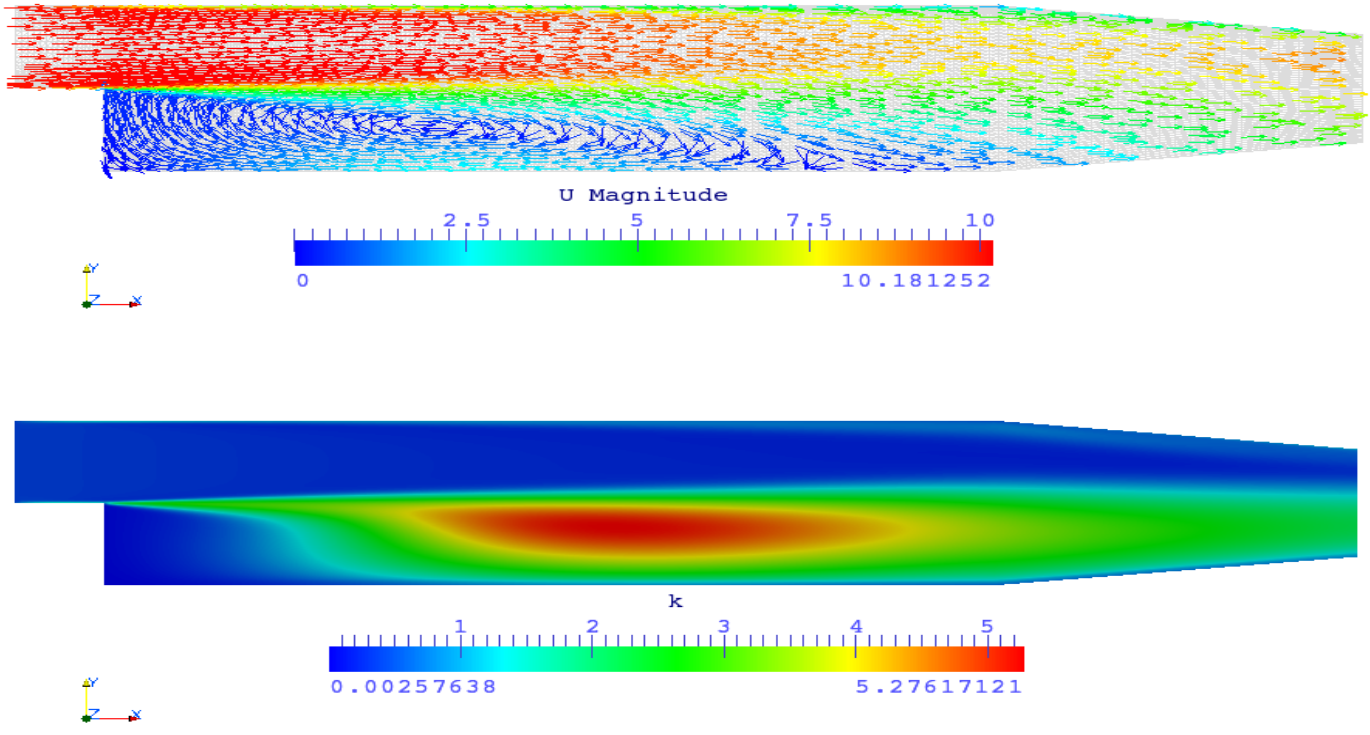


Without no non-orthogonal correction



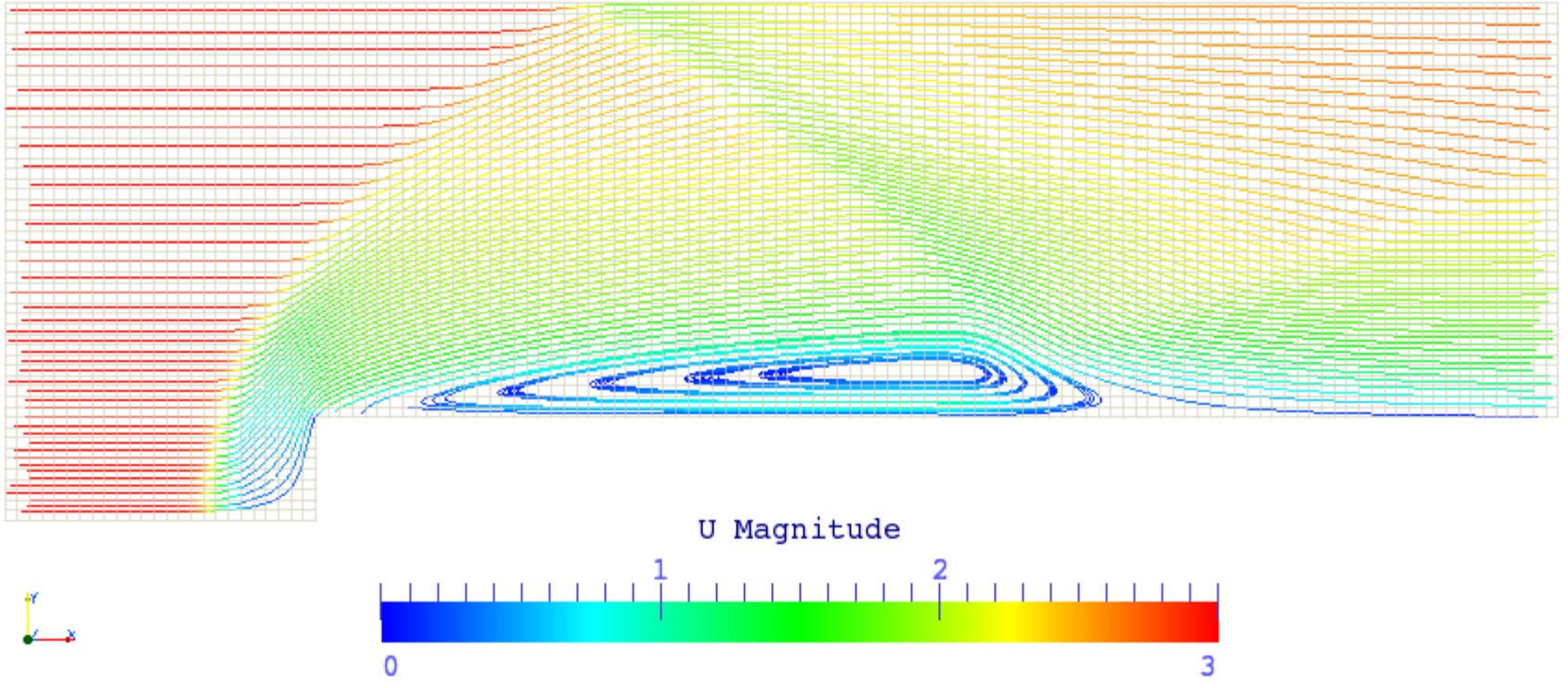
With non-orthogonal correction

simpleFoam : pitzDaily



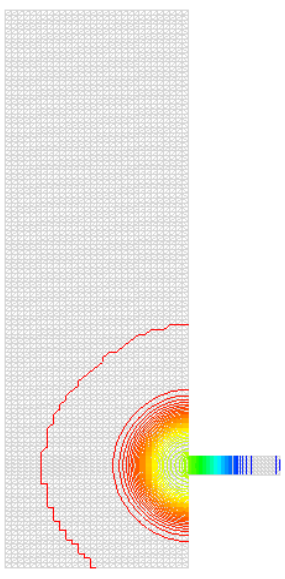
2D velocity glyph and kinetic energy surface plot.

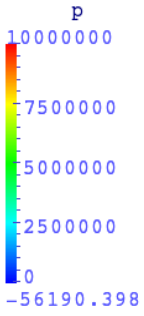
sonicFoam : forwardStep

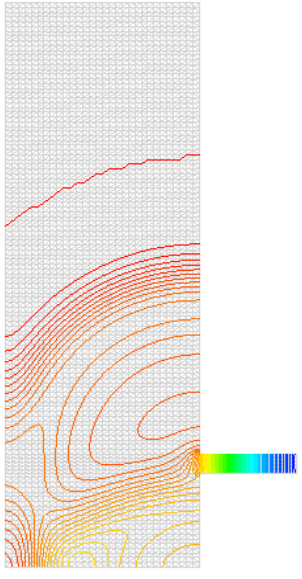


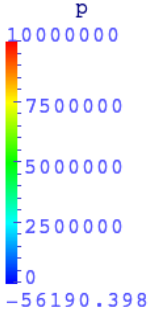
Velocity streamlines at inlet velocity of Mach 3

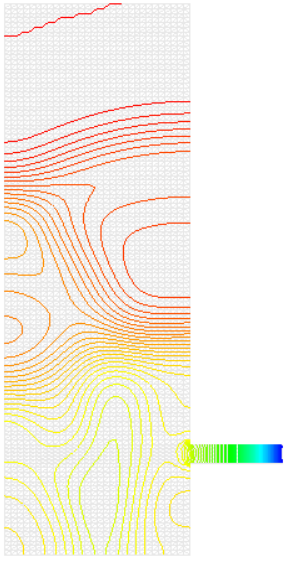
sonicLiquidFoam : decompressionTank







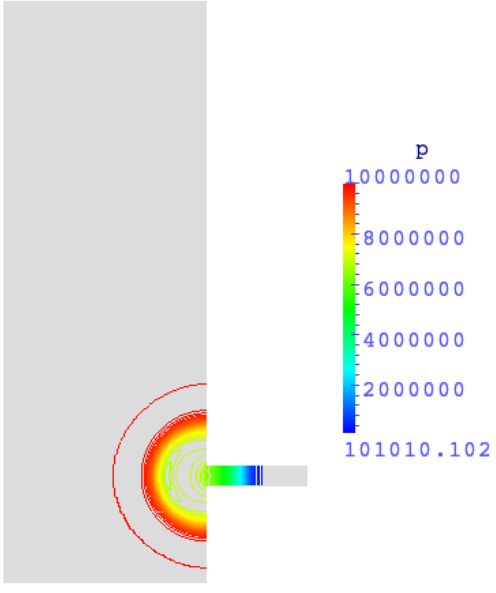




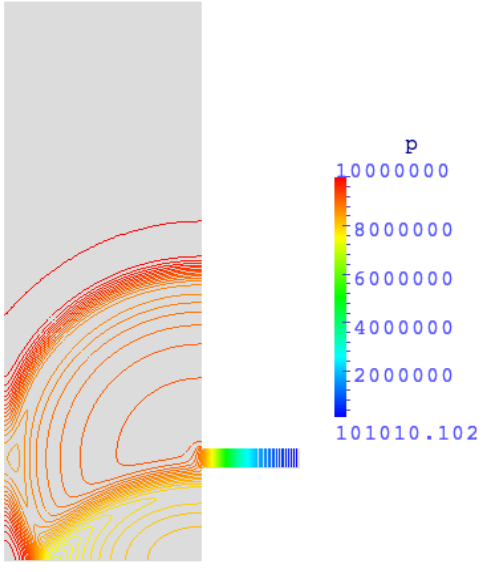
t=50μs t=100μs t=150μs

Pressure contours on a coarse mesh

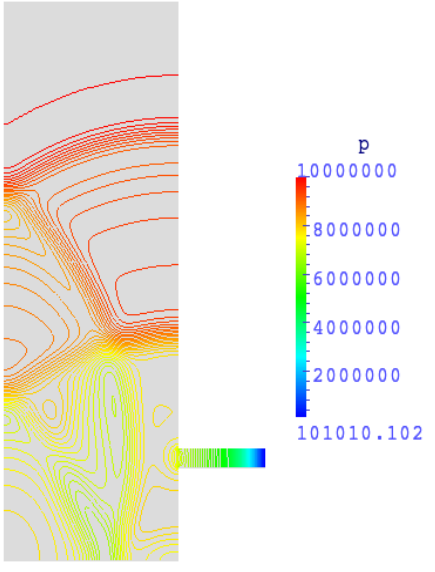
sonicLiquidFoam : decompressionTank



t=50μs



t=100μs

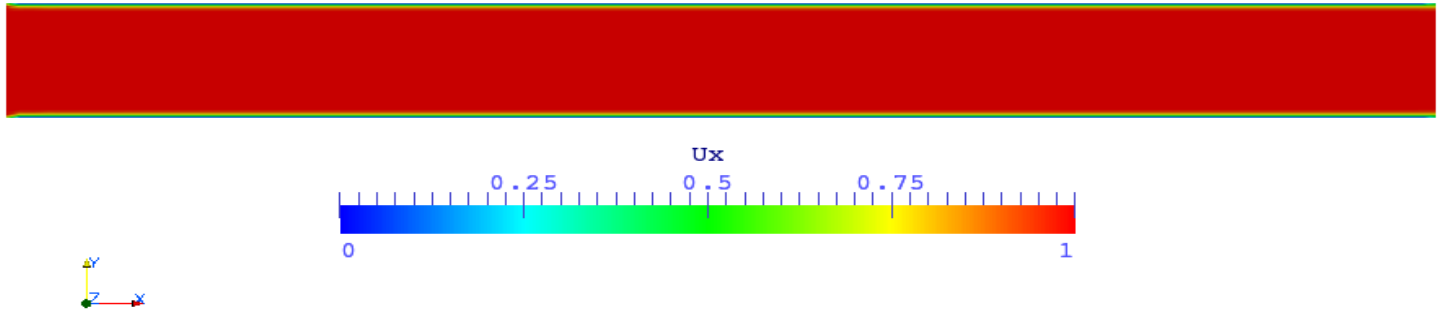


t=150μs

Pressure contours on a finer mesh

mhdFoam : hartmann

B = 20T



B = 1T