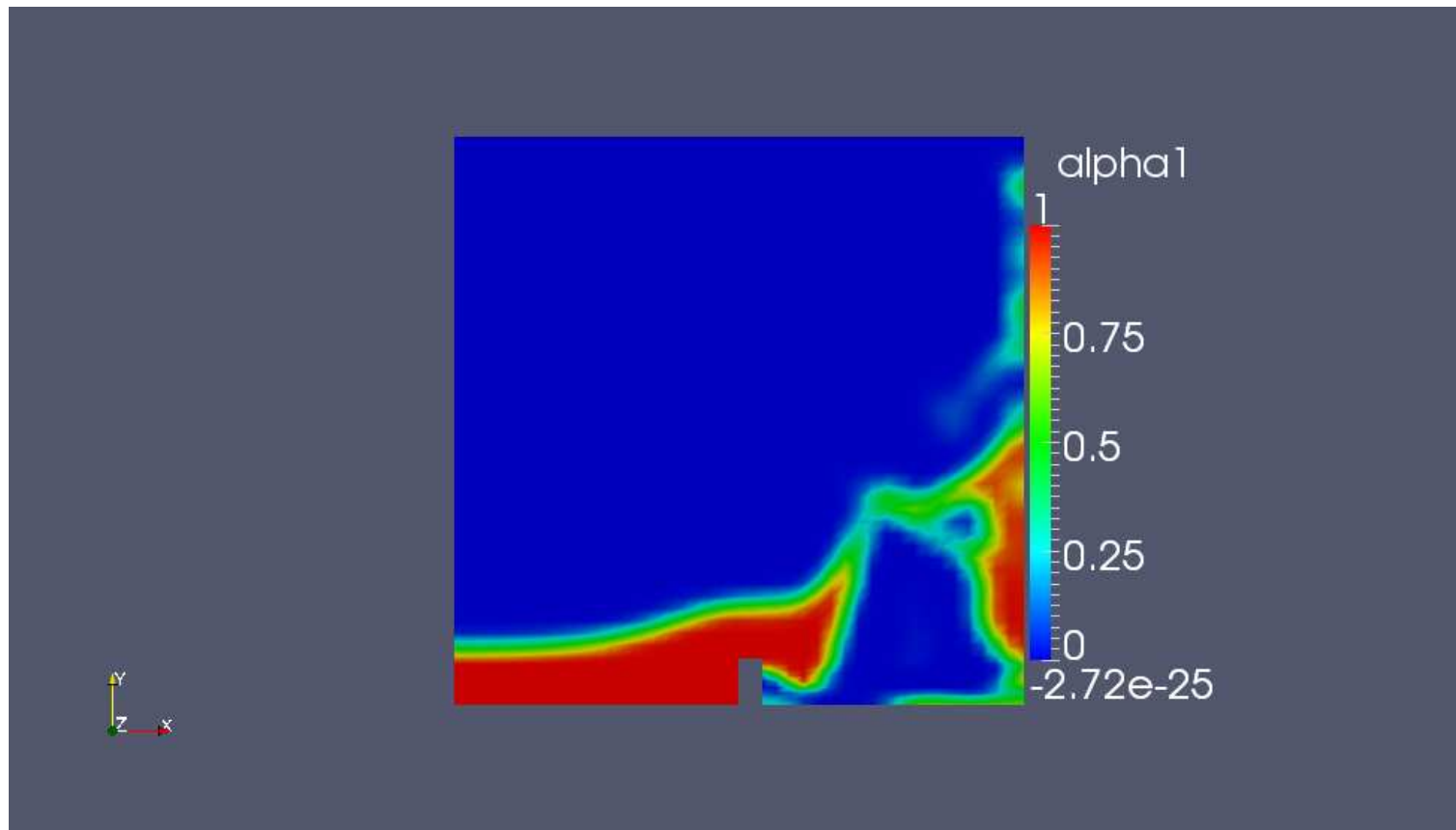
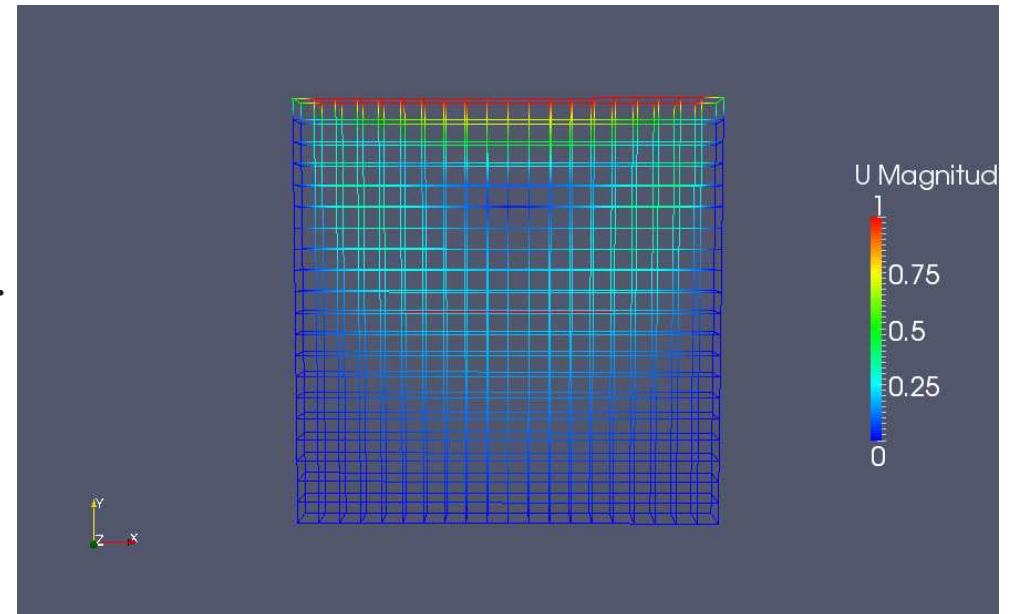


Assignment 1 OpenFOAM



Cavity

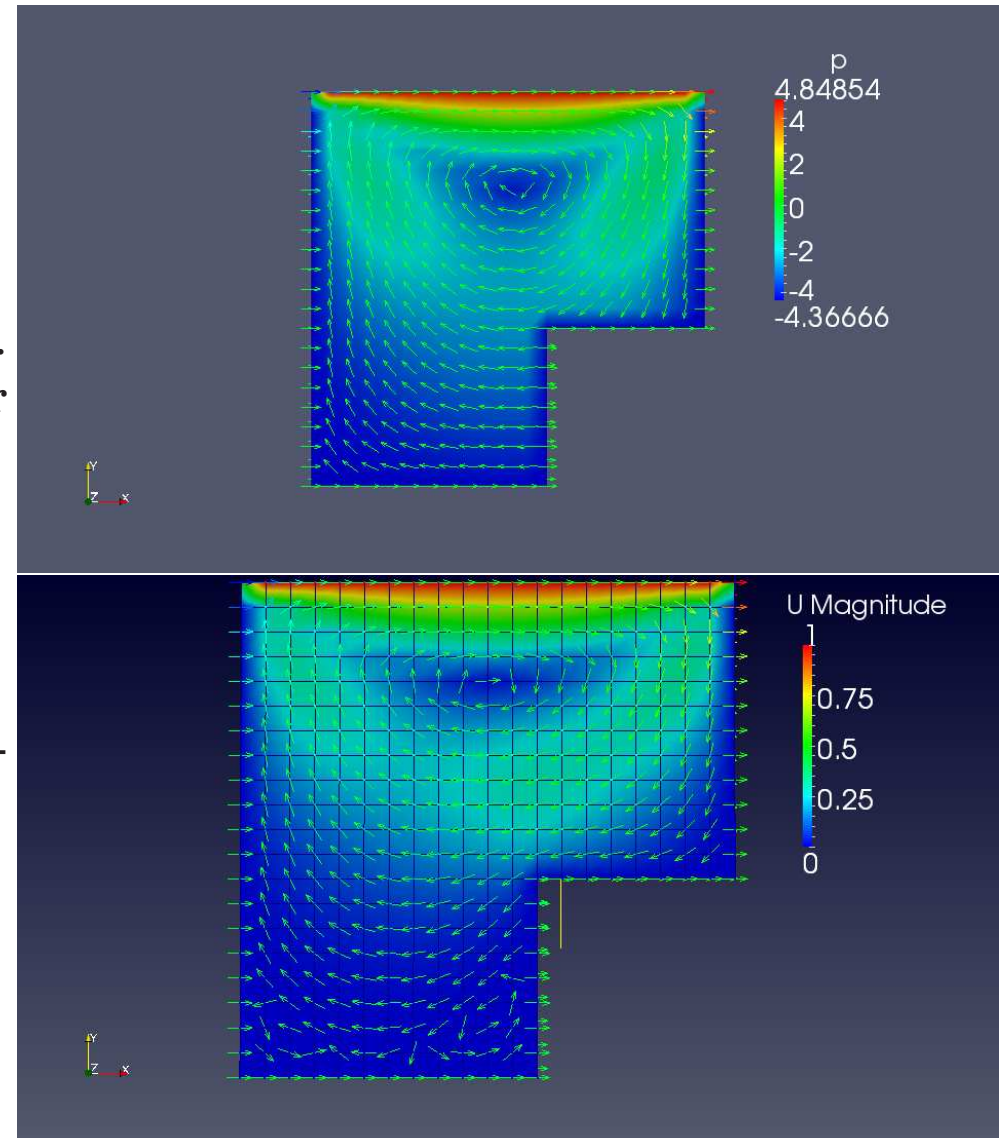
Go to style, choose wireframe and color by U.
Insert colorbar, choose blue to red.



Cavity-clipped

Go to style, choose surface and color by U.
 Insert glyph, choose 2D-glyph, scale off, color
 by p and insert colorbar for p.

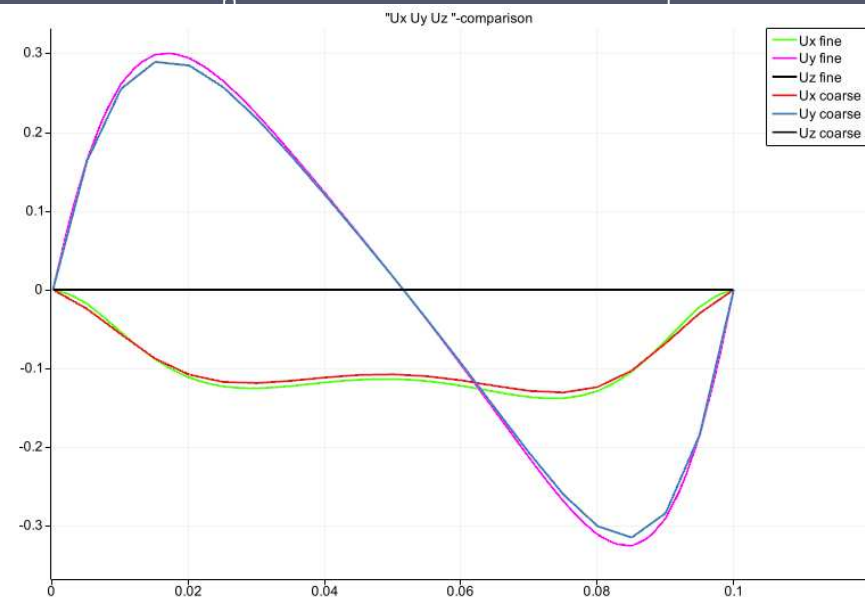
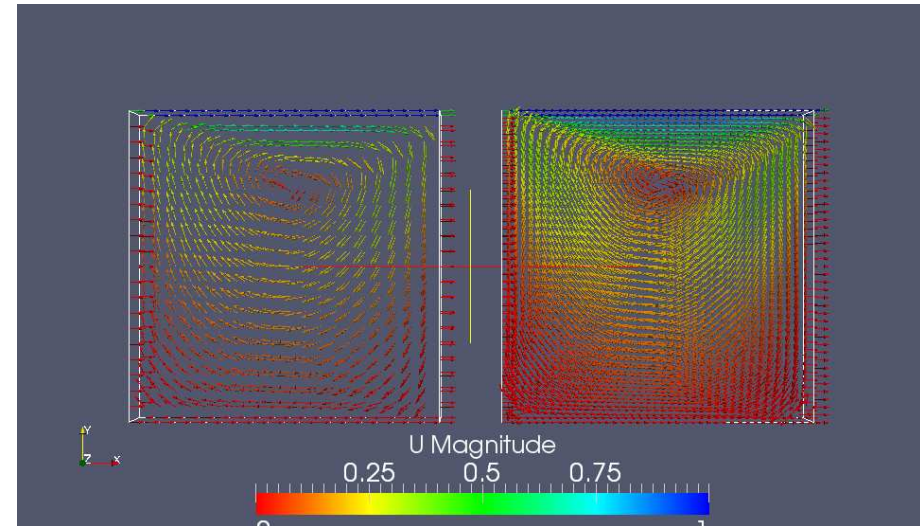
Do same as above, except now choose col-
 orbar for surface, i.e for U.



Cavity-fine

With the coarsely meshed version open, open the cavity-fine project, translate it, display as wireframe, insert glyph and change color to red to blue

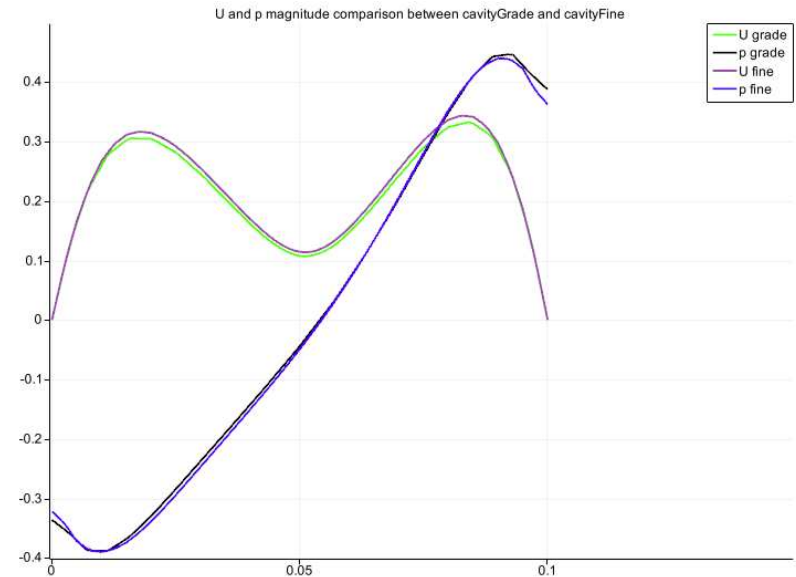
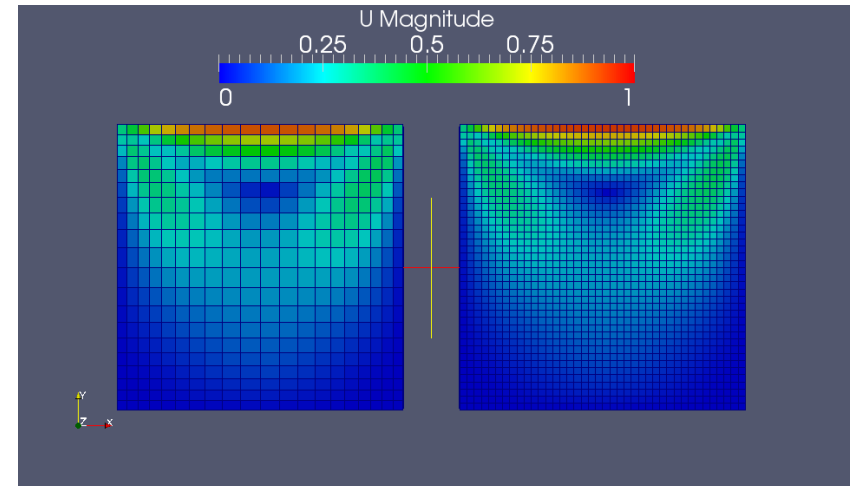
For both, insert plot over line (0,0.07,0.005), right click in diagram and edit title and legend.



Cavity-grade

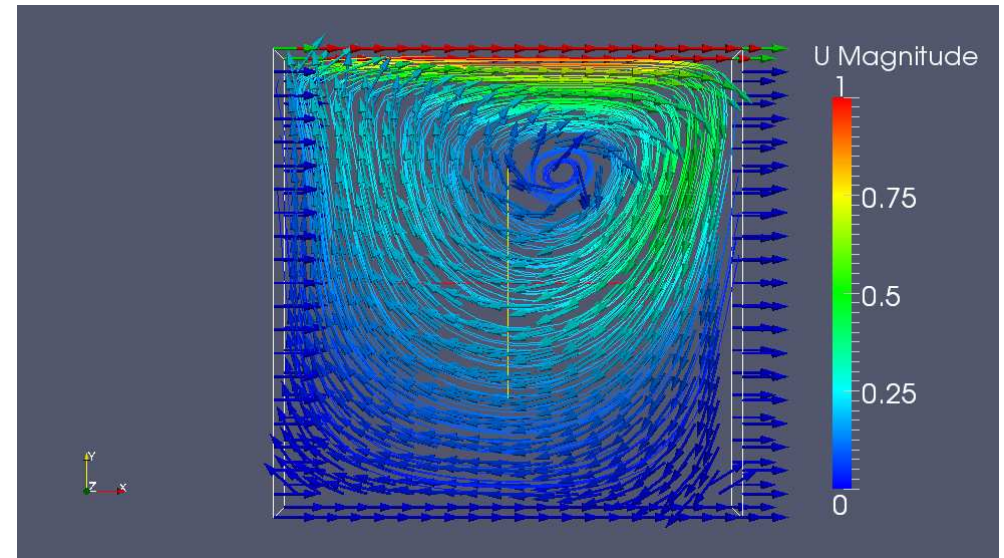
Choose display surface with borders. translate to compare with fine mesh

Change colors of lines by editing in Display-line series



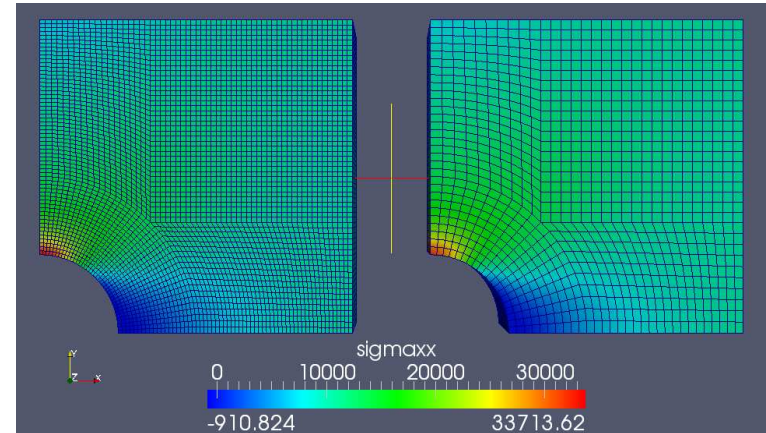
Cavity-Highresolution

Streamtracer, colored by U + 2D-glyph.

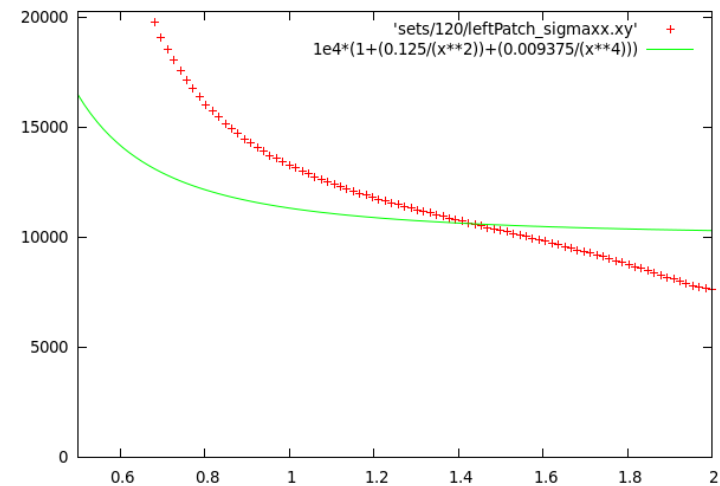


PlateHole

Drag colorbar to bottom of picture



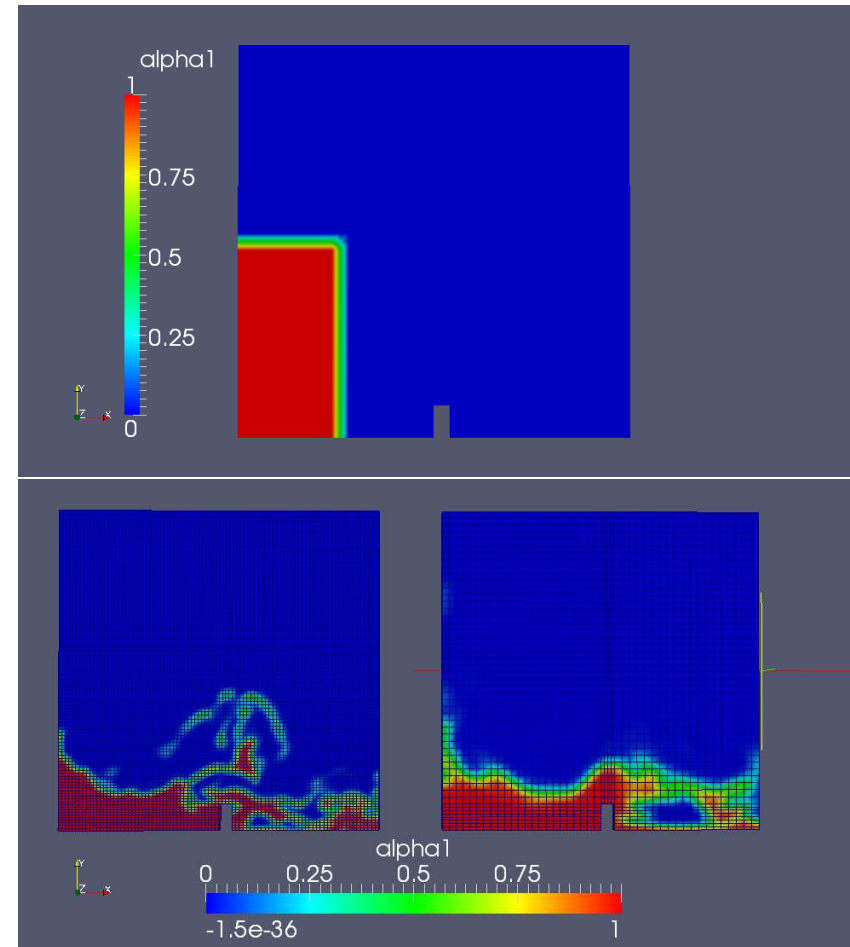
Analytical solution compared with simulated. (here gplot was used)



Dambreak

Change treshold to lower 0 and upper 1

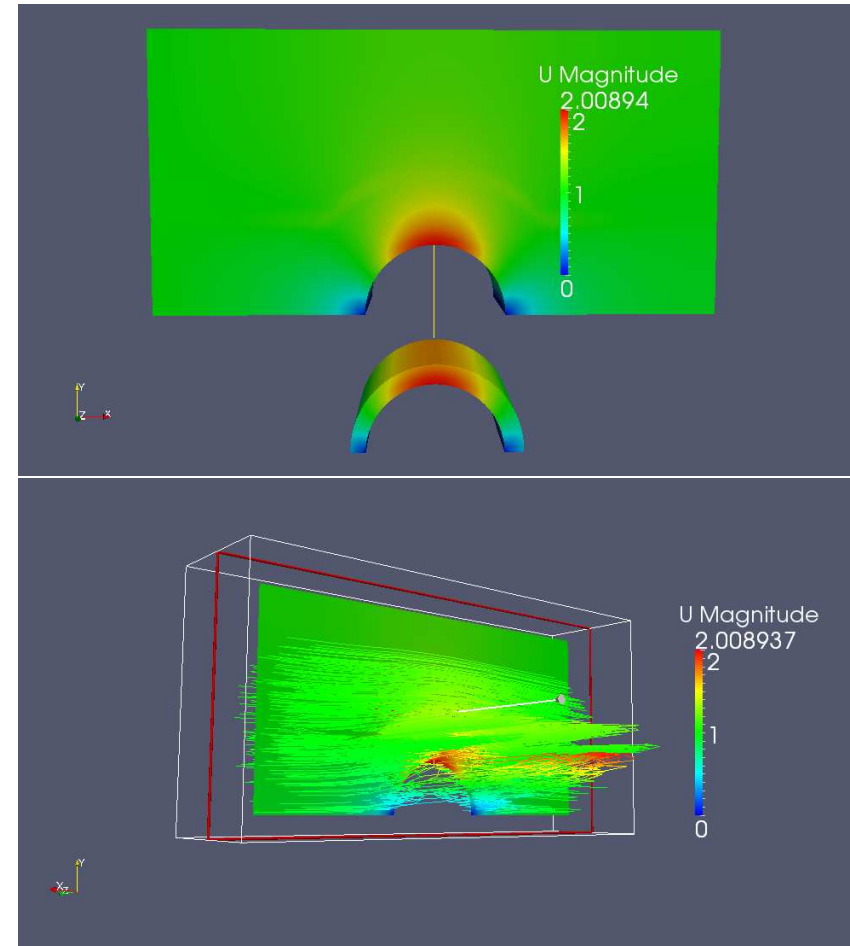
Compare fine with coarse



Cylinder

Open twice, translate, clip with sphere.

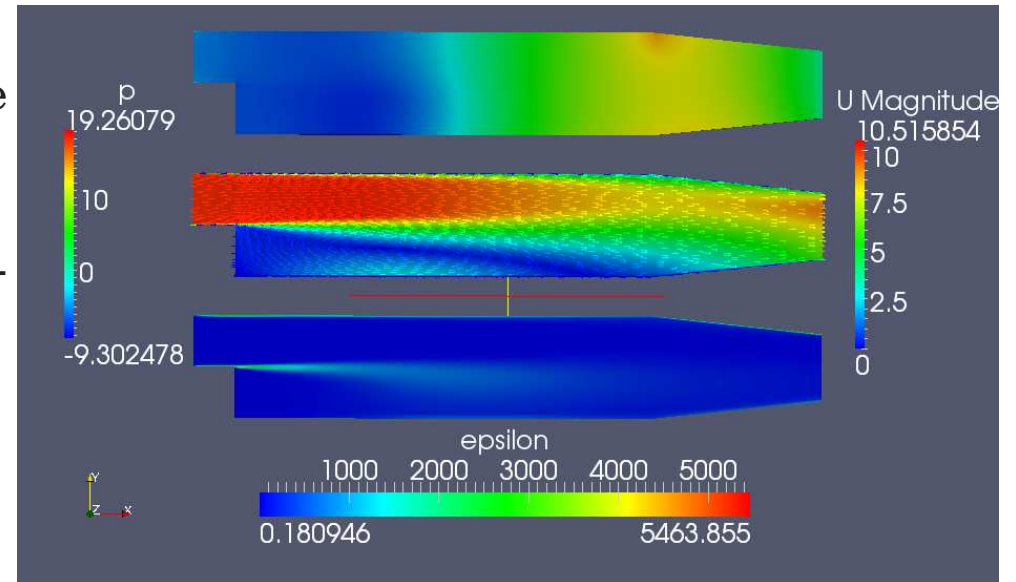
Insert streamli -1 = rotational flow 0 = simple shear flow 1 = planar extensional flowne, slice z-normal, warp by vector vorticity



Pitzdaily

Open three of same project, translate, choose surface by different variable.

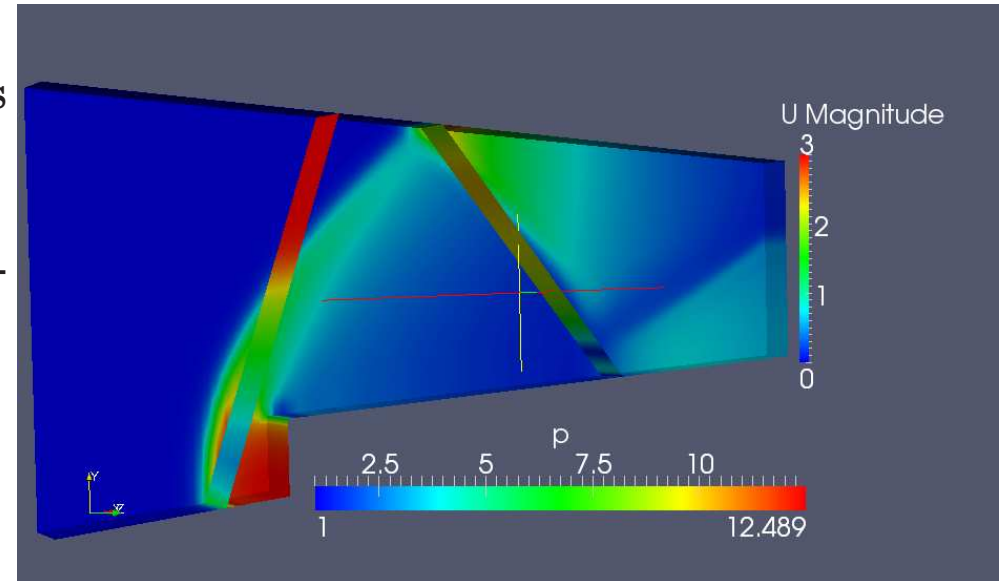
Shown here: Pressure, velocity and epsilon.



Forwardstep

Open two of same project insert two slices with surface of U in one of them.

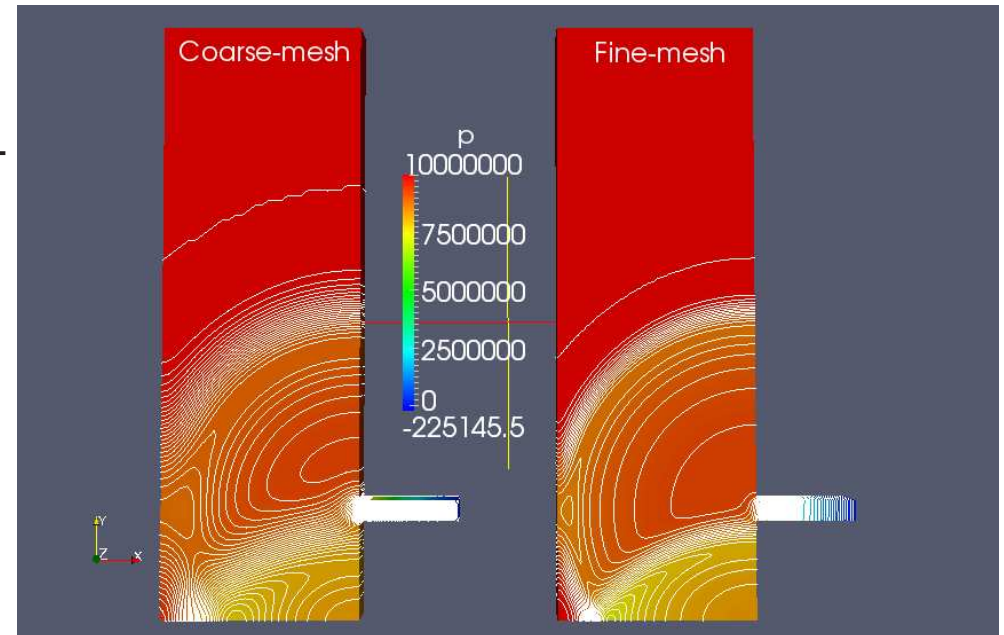
In second, use P on surface and set back-face style to cull frontface.



Decompression tank

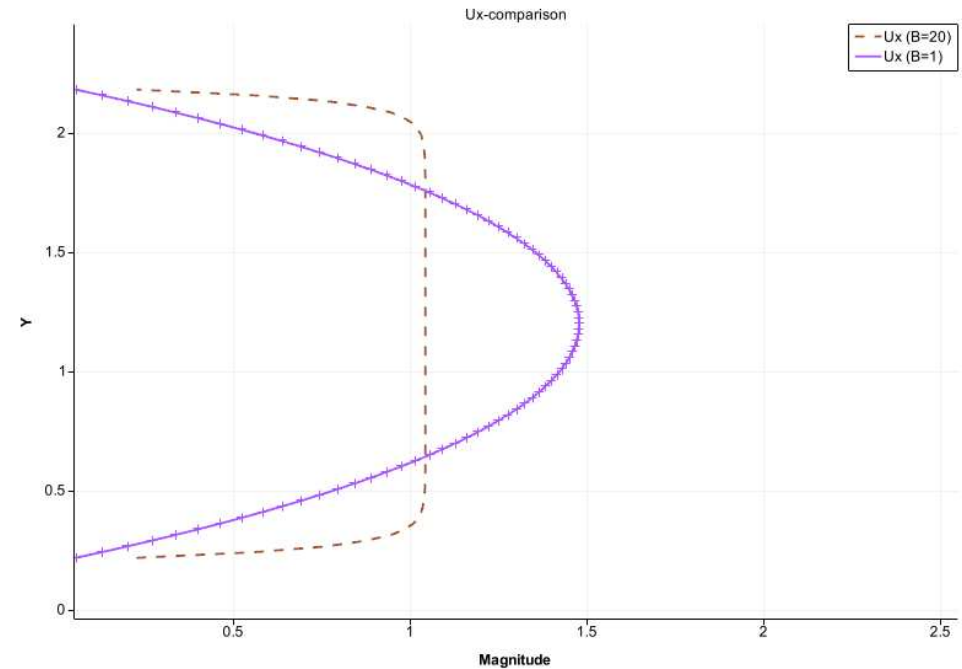
Open two of same project, choose contour-
wireframe- color- solid.

Go to sources, text, place where wanted.



Hartmann

Go to filters - alphabetical - plot over line.
For x-axis data choose U_x , in line series choose arclength and re-label to U_x .
Also edit linestyle, linecolor, markerstyle.



Modified case - forwardstep - Part 1

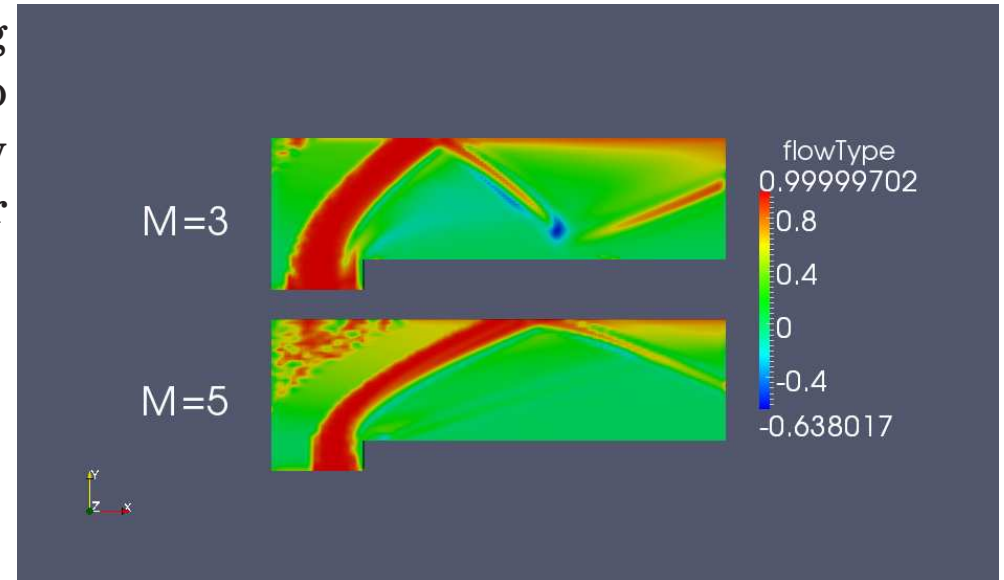
Modify the forwardStep case by changing the initial inlet velocity to 5. Use postprocessing utility flowType after running sonicFoam to calculate from the velocity field whether flow is rotational, simple shear flow or planar extensional flow.

Where:

1 = rotational flow

0 = simple shear flow

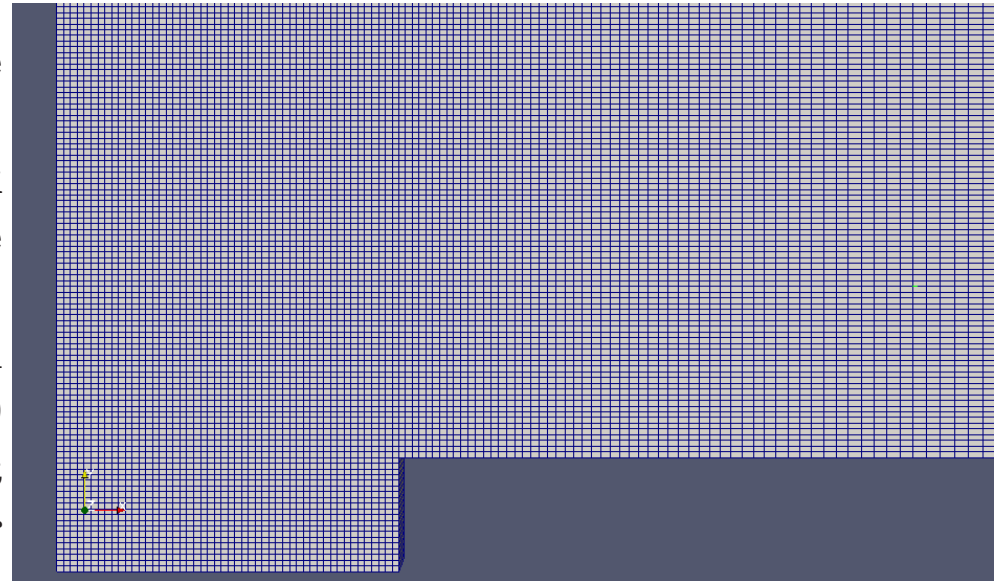
-1 = planar extensional flow



Modified case - forwardstep - Part 2

Furthermore it might be interesting solving for a finer mesh, to see if the "rotational flow"-tendencies here are a result of the coarseness. Therefore we double the cell-amounts on the two first blocks (i.e the blocks before the step. Now we also need to grade the last larger block so that the change of cellsize doesn't become overwhelming.

This is done by editing the blockMeshDict. In the blocks section change the two first to: (50 20 1) and (50 80 1) respectively. Also edit the last one so that the two blocks fit in y-dir (i.e (100 80 1)). Now for this last block also change grading to (3.8 1 1), now its graded in x-direction.



Modified case - forwardstep - Part 3

Now when comparing the two meshes in paraFoam (both run for $M = 5$) we see that this region is now even more widespread in the first two blocks.

