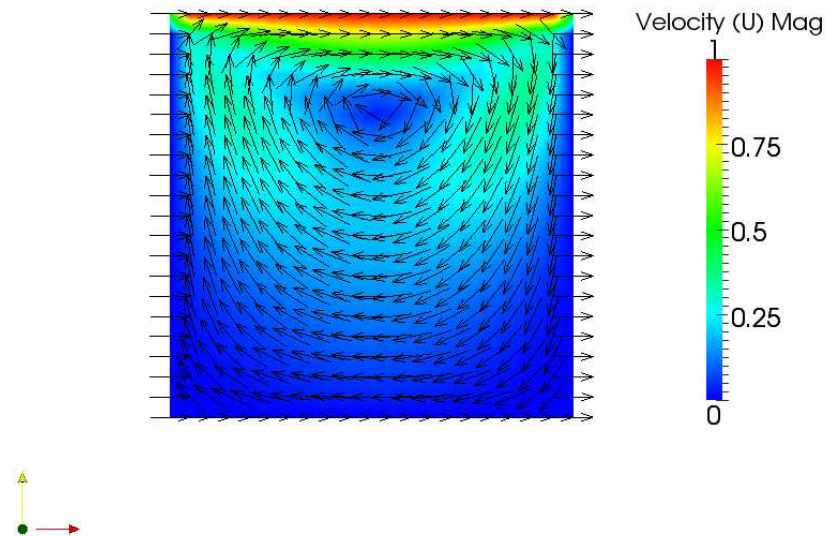
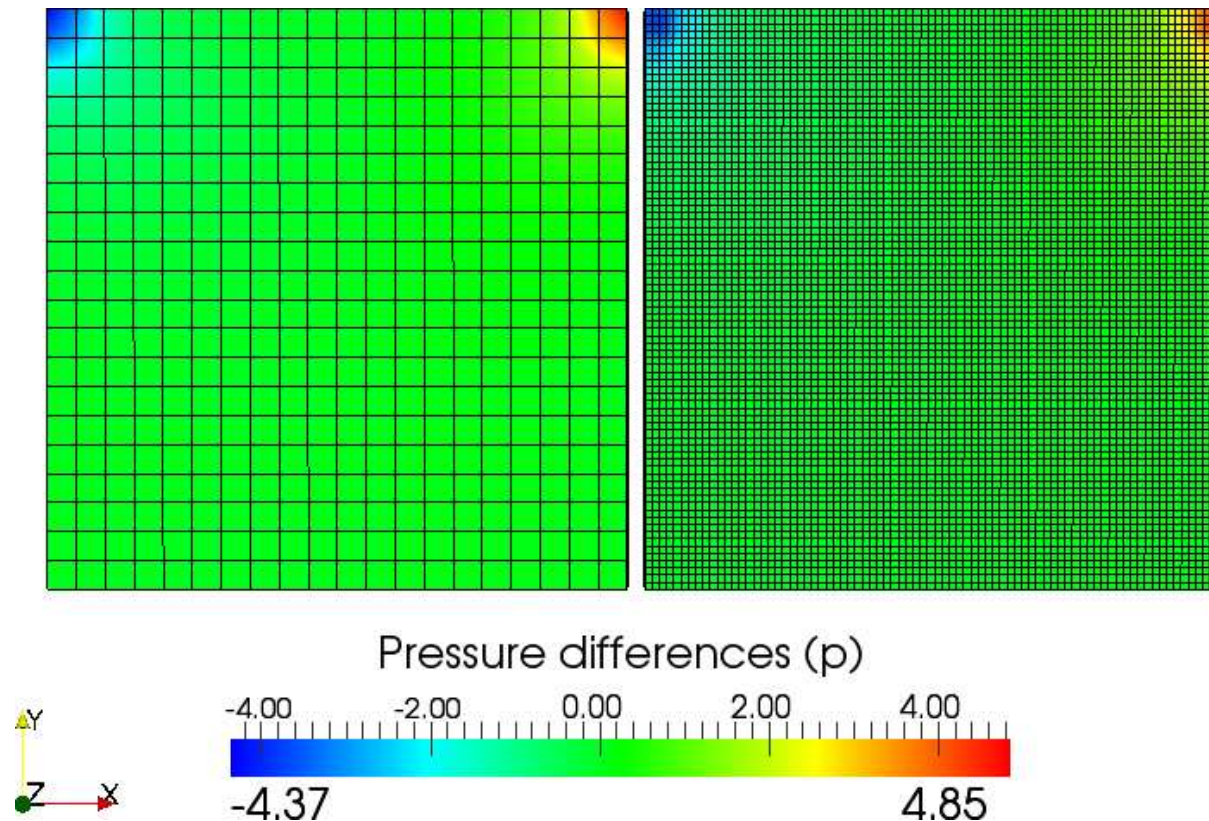


## Tutorial: cavity



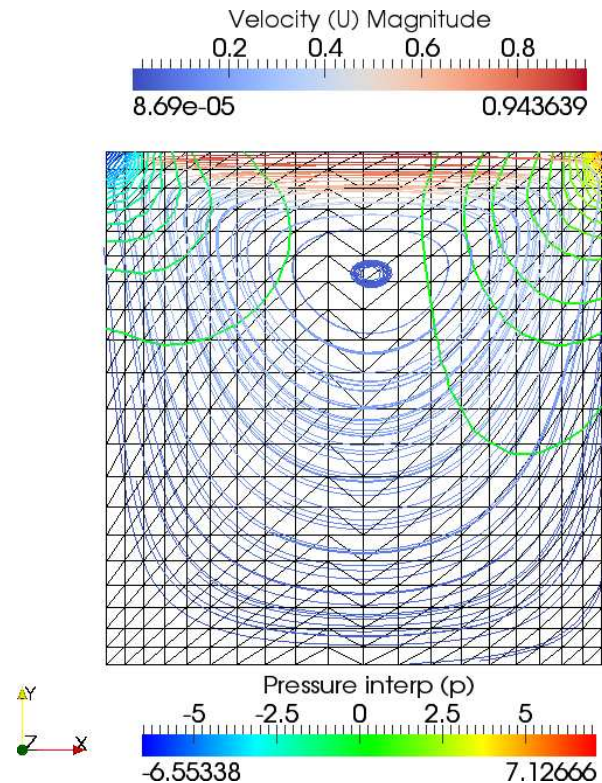
- The figure shows the velocity field over the cavity flow. It is post-processed by taking a plane in z-axis center where the velocity-field is shown together with glyph.
- The glyph is set to show simple black arrows, non-scaled, to get a simpler view of the motion of the fluid.
- The plane is as mentioned before taken in z-axis in the center of the mesh.

## Tutorial: cavityFine



- Figure comparing the two meshes "cavity" and "cavityFine" to get a better view of the differences of the two cases.
- The pressure distribution is the same on the both different cases which confirms that both meshes give the same answer.

## Tutorial: cavityGrade

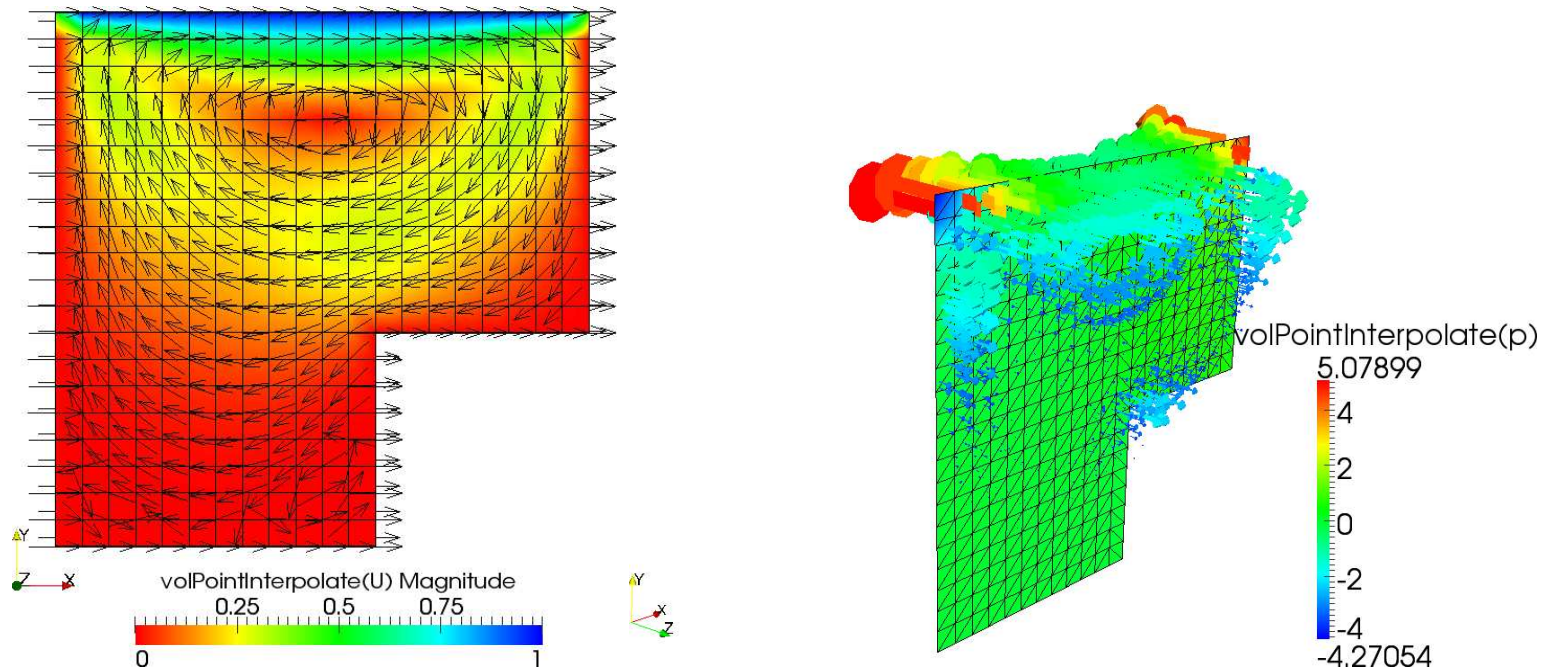


- The "cavityGrade" is refined at the bottom, top, left and right side. A z-plane is taken in center of the mesh and were the grid is shown which confirms the grading.

## Tutorial: cavityGrade

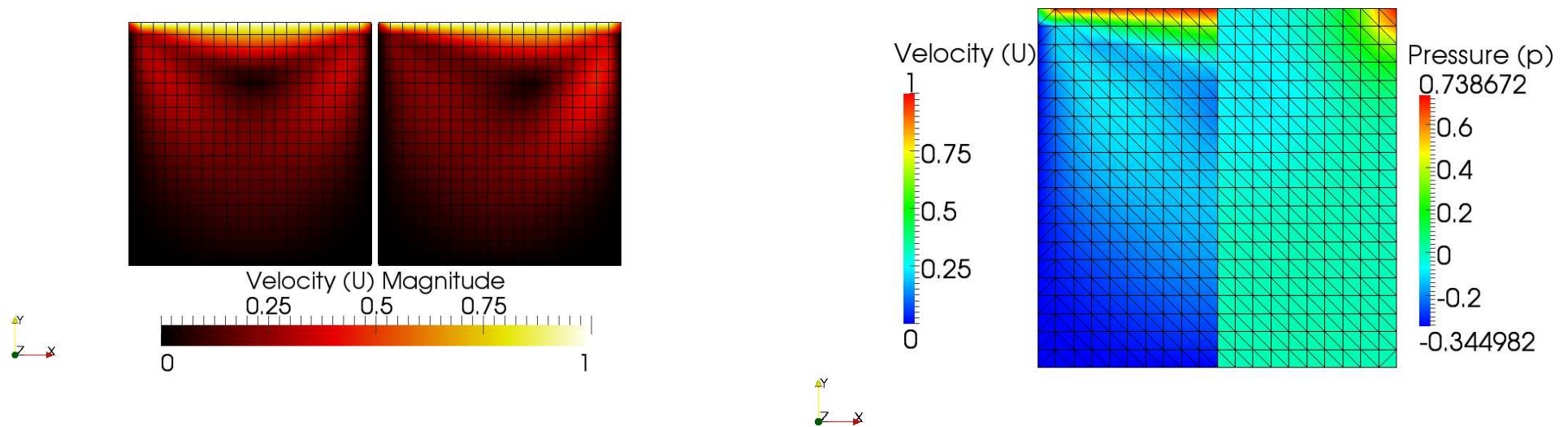
- Further more a contour plot over the pressure is made together with a "Stream-tracer" over the velocity.
- Simplified view by using different colourschemes over the pressure and velocity.

## Tutorial: cavityClipped



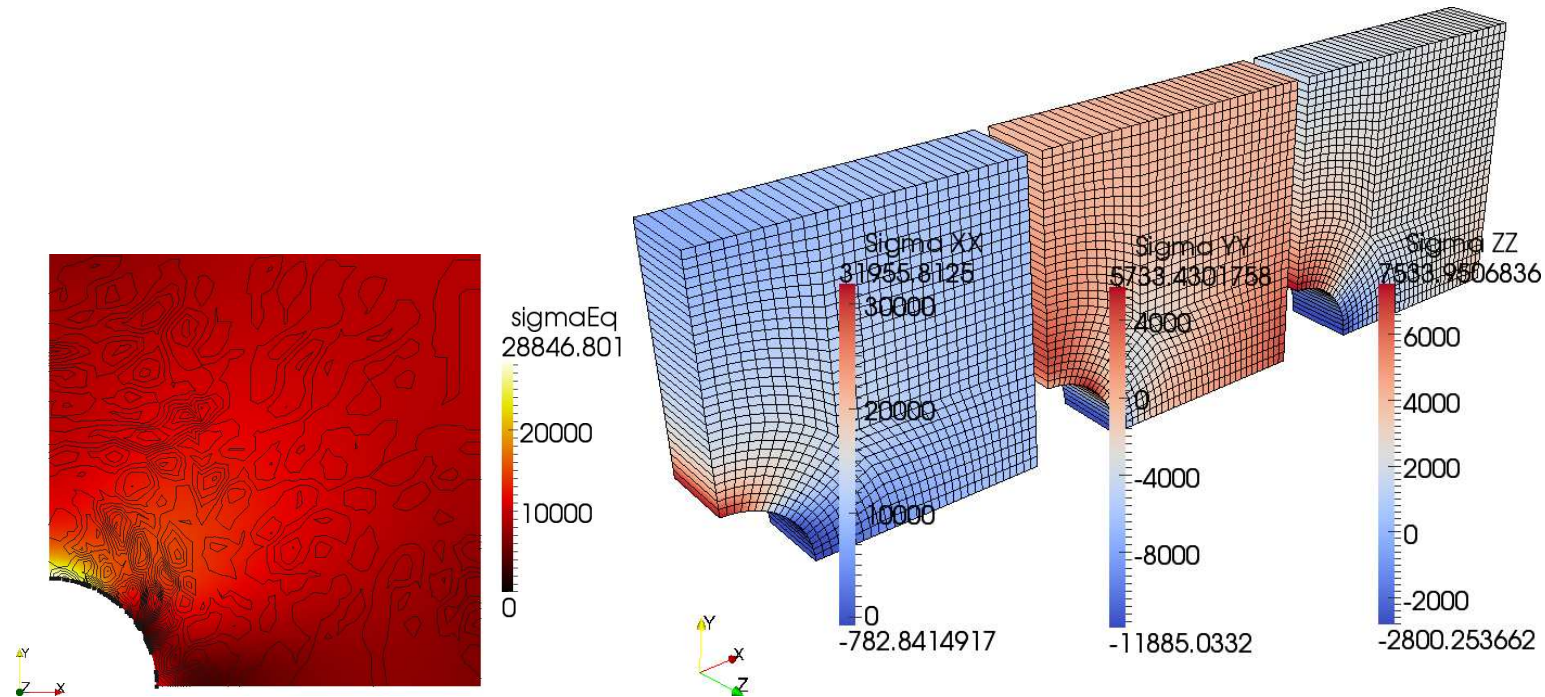
- The "cavityClipped" has compared to the previous cases a change in domain.
- The left plot is quite simple with a surface mesh containing the velocity field. On this a vector field which shows the velocity direction is plotted.
- The right plots shows a z-plane on the pressure distribution together with the vorticity vectors. The vorticity vectors are extruded by a "Stream-tracer" and then a "Glyph"

## Tutorial: cavityHighRe



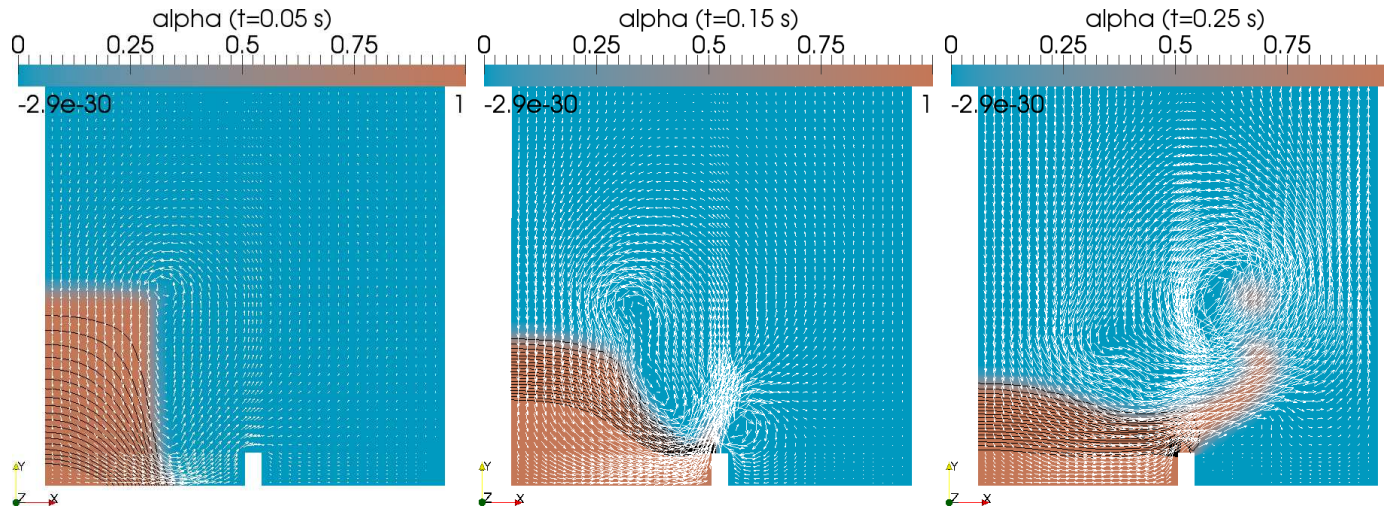
- The left figure shows a plot over the "cavity" and "cavityHighRe" cases to compare their velocity distribution. Higher velocity magnitude is found in "cavityHighRe".
- The right plot shows the velocity and pressure at half of the domain. This is made by a two "Clips", both on y-axis but in opposite directions, that shows half of the domain each.

## Tutorial: plateHole



- The first figure shows how the stress-field are developed in the plate. First a "Slice" is made followed by added contours.
- The right figure shows the difference between the  $\sigma_{xx}$ ,  $\sigma_{yy}$  and  $\sigma_{zz}$ . It is done by opening three versions of the domain bind them to the different stresses. The different sigma values is calculated by "foamCalc".

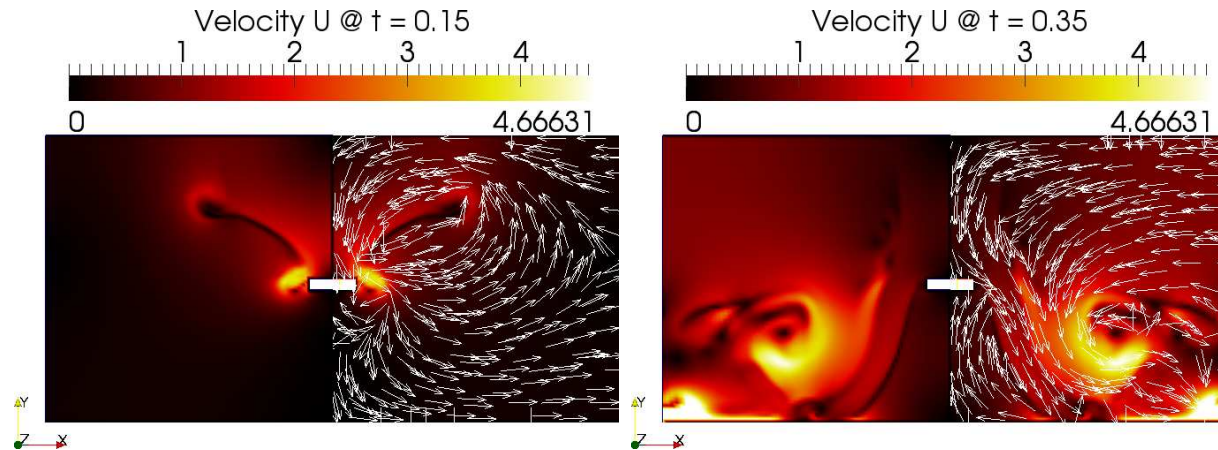
## Tutorial: damBreak



- The three different figures shows the alpha1 as a plane cut in z-axis together with a contour plot over the preassure and the velocity as "Glyph".
- The same typ of figure are taken at three different time steps.

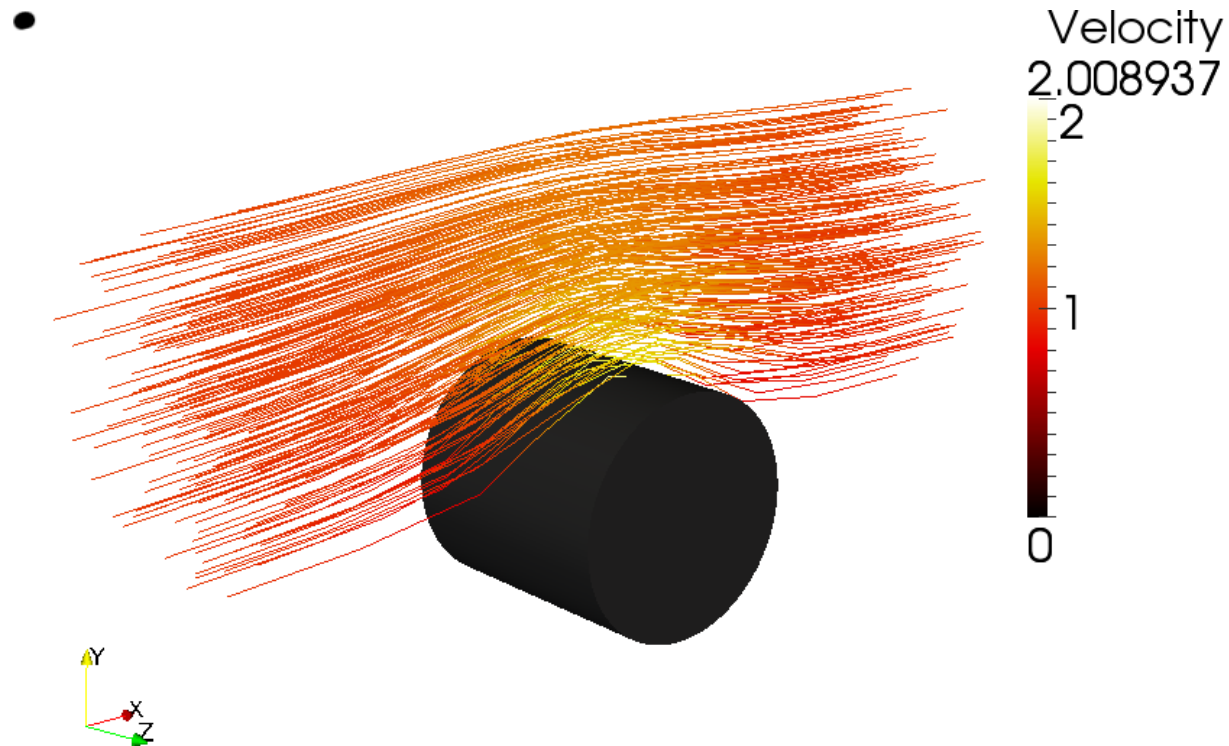


## Tutorial: damBreakFine



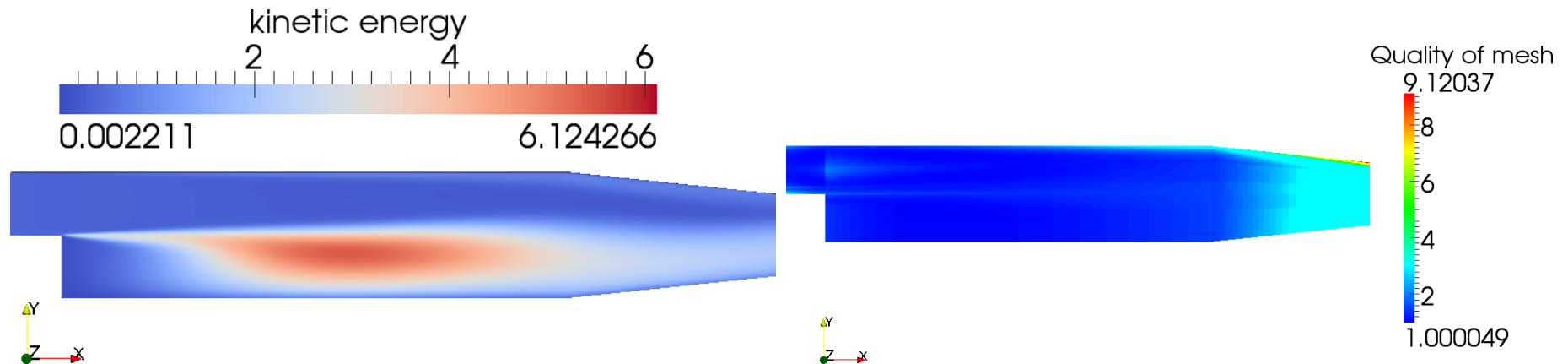
- The figure above shows the damBreakFine. Two domain are opened at the same time, translated and oriented to give a more pleasant viewing experience. Both shows the velocity on their surfaces and one of them shows also vector arrows of the velocity. The domain is rotated in such way that is looks like the alpha field splinter against the column in the middle.

## Tutorial: cylinder



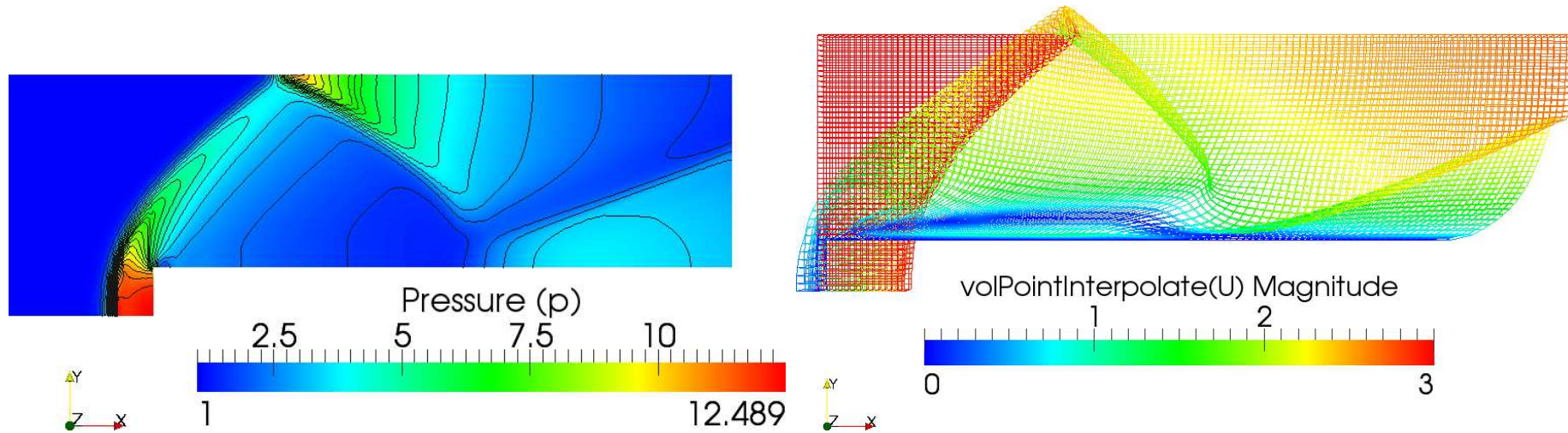
- Modified the case by adding a cylinder, after that a "Stream tracer" around the cylinder to visualize that the flow flows around the cylinder. The flow seems to bend around the cylinder.

## Tutorial: pitzDaily



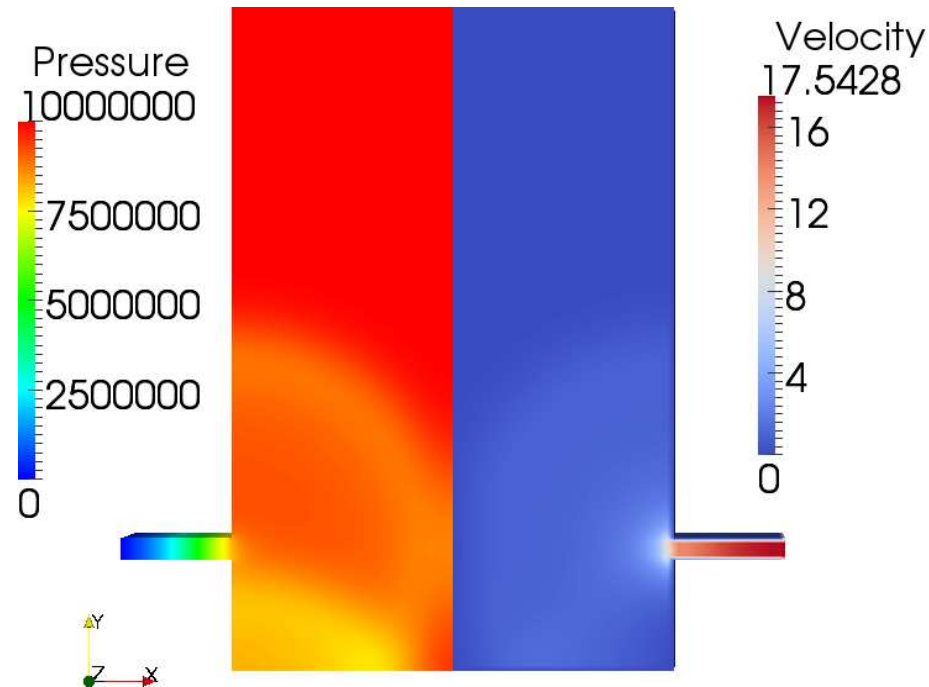
- First figure is a simple plot over the kinetic energy.
- Second plot show the quality of the mesh, blue areas is the same as a good mesh which confirms that our case is solved with a preferable mesh quality.

## Tutorial: forwardStep



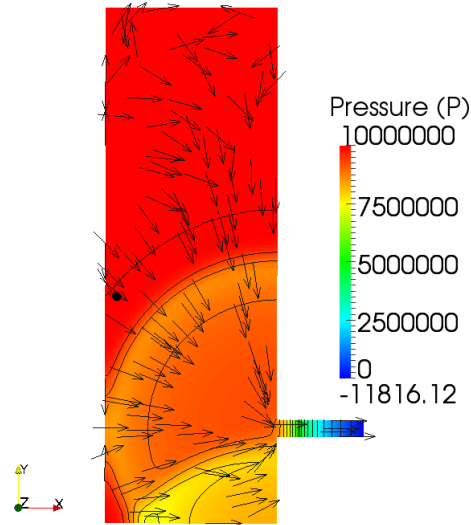
- First figure shows the pressure distribution over the system. It is done by creating a simple z-plane and let it show the pressure distribution. After that adding black contour lines and colour them black.
- Second plot uses a function called "Warped by vector".

## Tutorial: decompressionTank



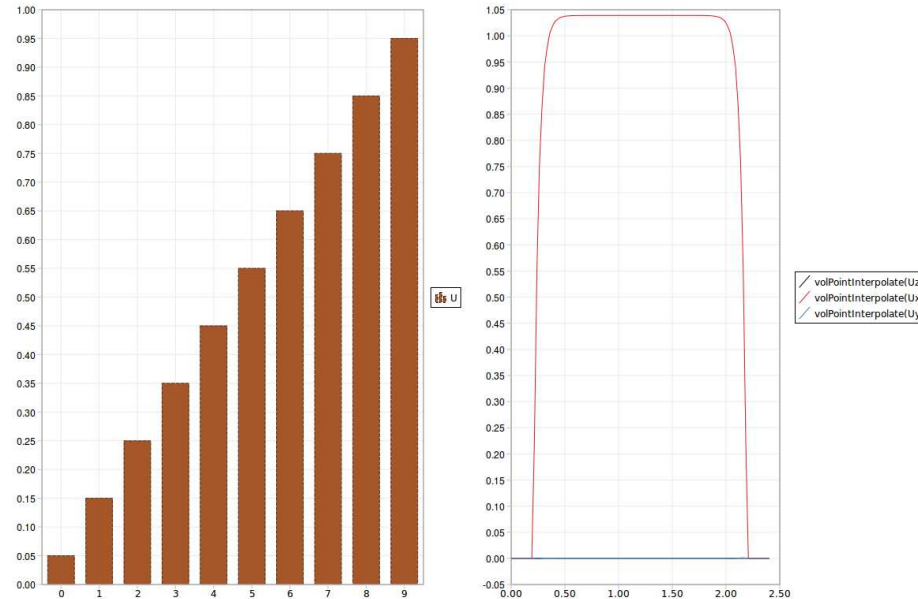
- This figure shows the pressure and the velocity field on the decompression tank. According to the figure the magnitude and pressure differences are large.

## Tutorial: decompressionTankFine



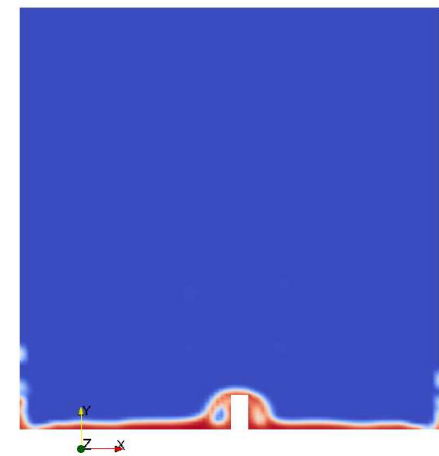
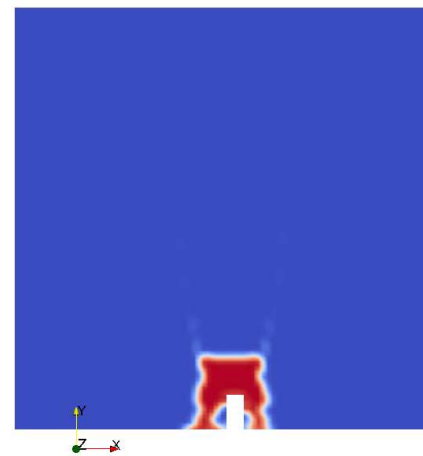
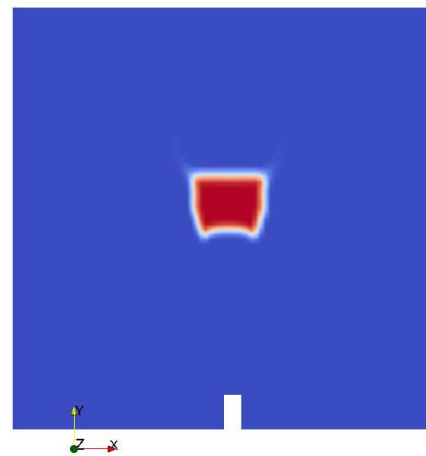
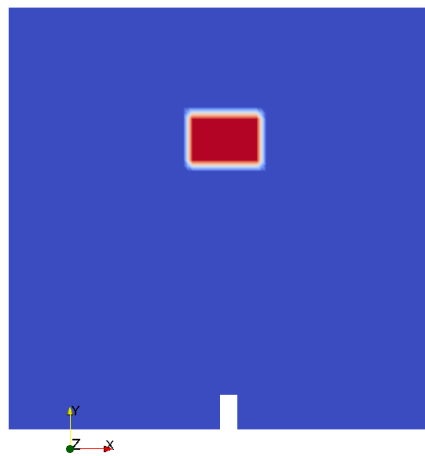
- A z-plane has been created together with the pressure distribution. On this, black pressure distribution contour line has been added together with black velocity vectors. Recognize the perpendicular velocity arrows compared to the pressure field.

## Tutorial: hartman



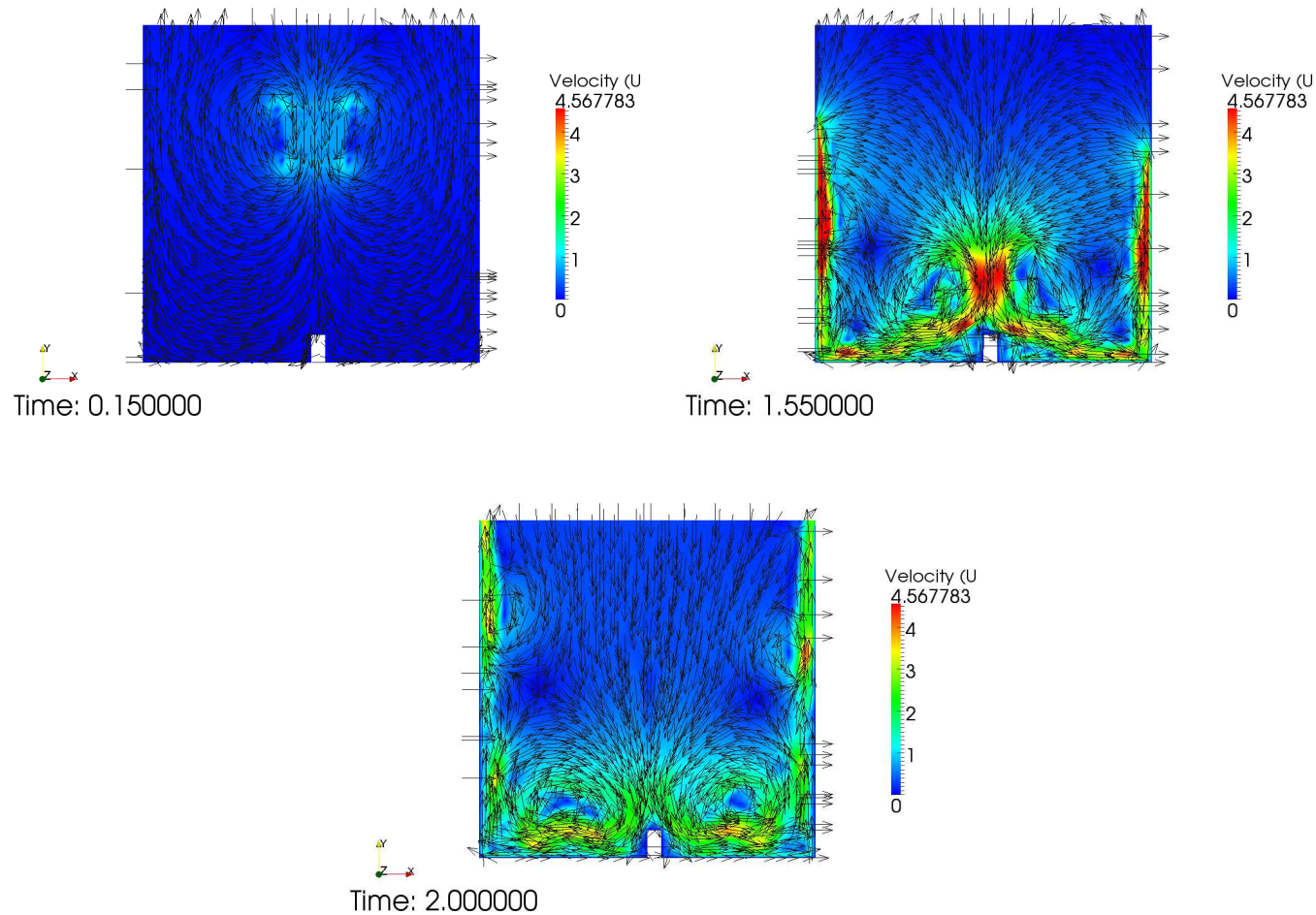
- How common each velocity is described by a simple histogram over the velocity.
- This second chart shows the velocities from a line from the middle of the domain in y-direction (bottom to top of the domain). The result is that the velocities through the cross-section is largest in x-direction, the contribution from the z- and y-direction is negligible.

## Tutorial: Edit of dambreakFine





# Tutorial: Edit of dambreakFine



## Tutorial: Edit of dambreakFine

- The figure shows how the alpha field develops on four different time-steps of the event, also three figures at different time steps over the velocity field and its velocity vectors.
- The changes from the standard "dambreakFine" case is that the gravitation has been lowered into  $-4.81 \text{ m/s}^2$  instead of  $-9.81 \text{ m/s}^2$ . Changed in "constant/g".
- The domain has also been increased a little bit in size, this was done by changing in the "constant/polyMesh/blockMeshDict"
- Also a movement of the alpha-field has been done. The field is moved to the center of the domain where it can crash against the small column, it has also been increased in size compared to the standard case, by changing the "system/setFieldsDict".
- There has also been a change in the stoptime. It now runs for 2s. This was changed in "system/controlDict"