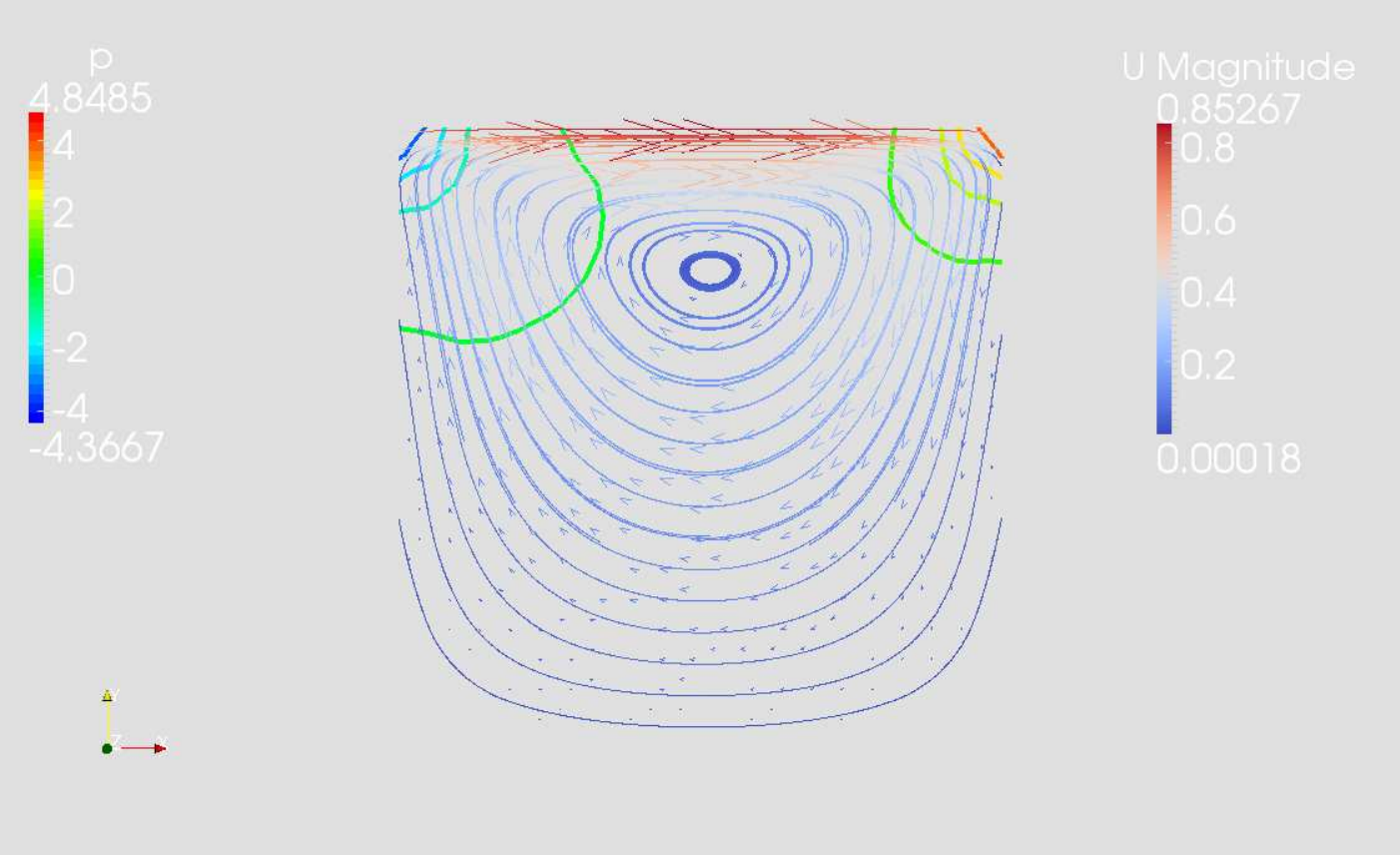
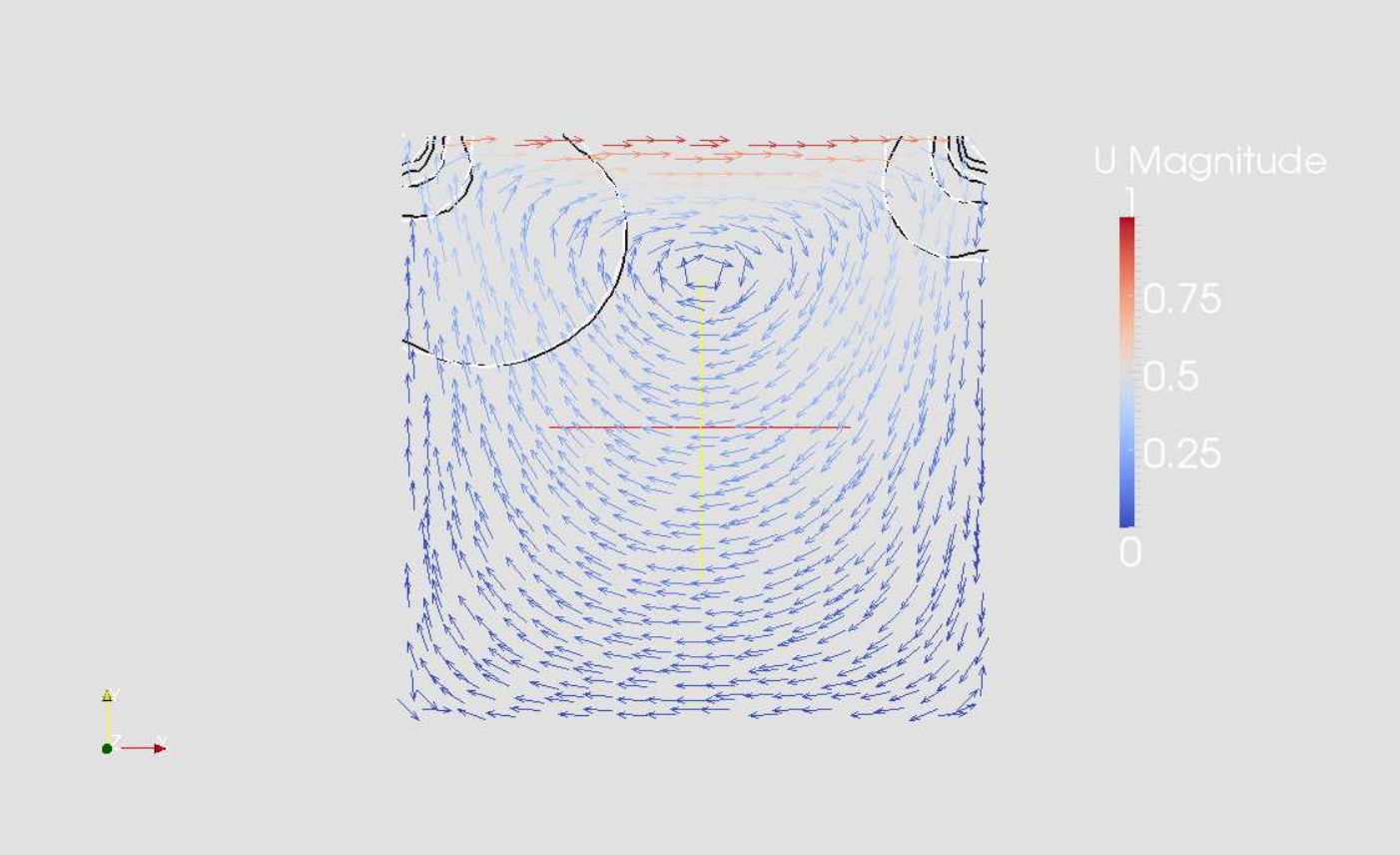
# Tutorial: cavity



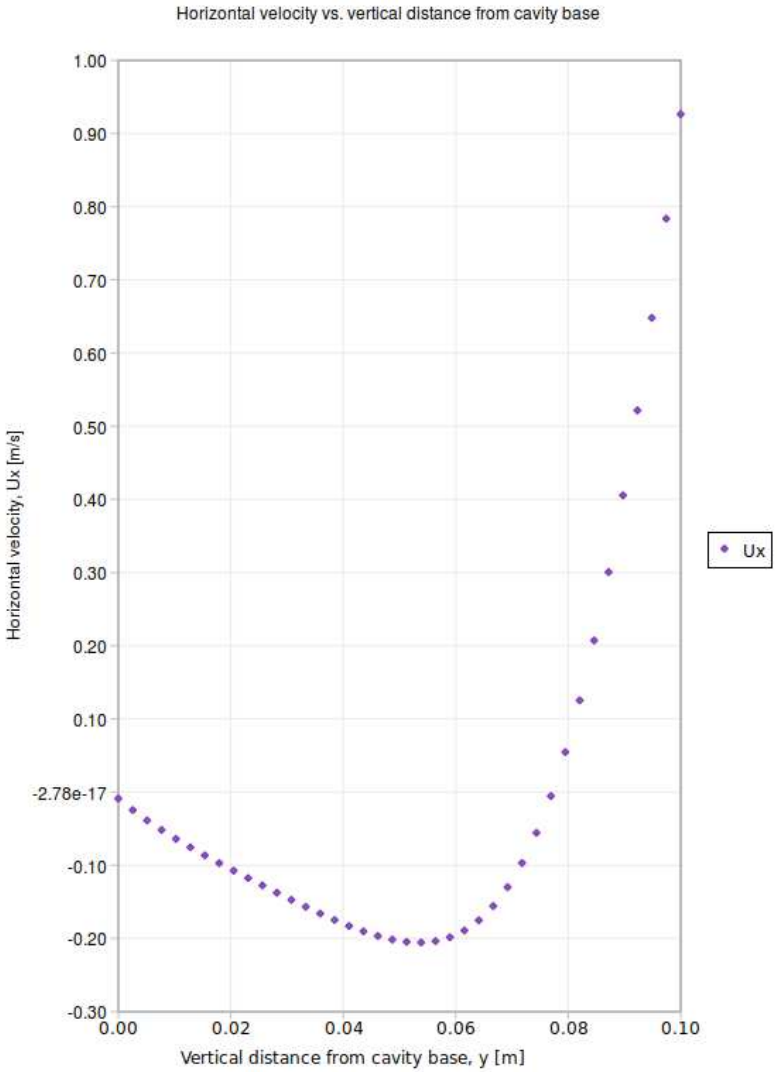

- Contourplots of pressure, and streamlines with velocity vectors coloured by velocity magnitude; steady-state.

# Tutorial: cavityFine



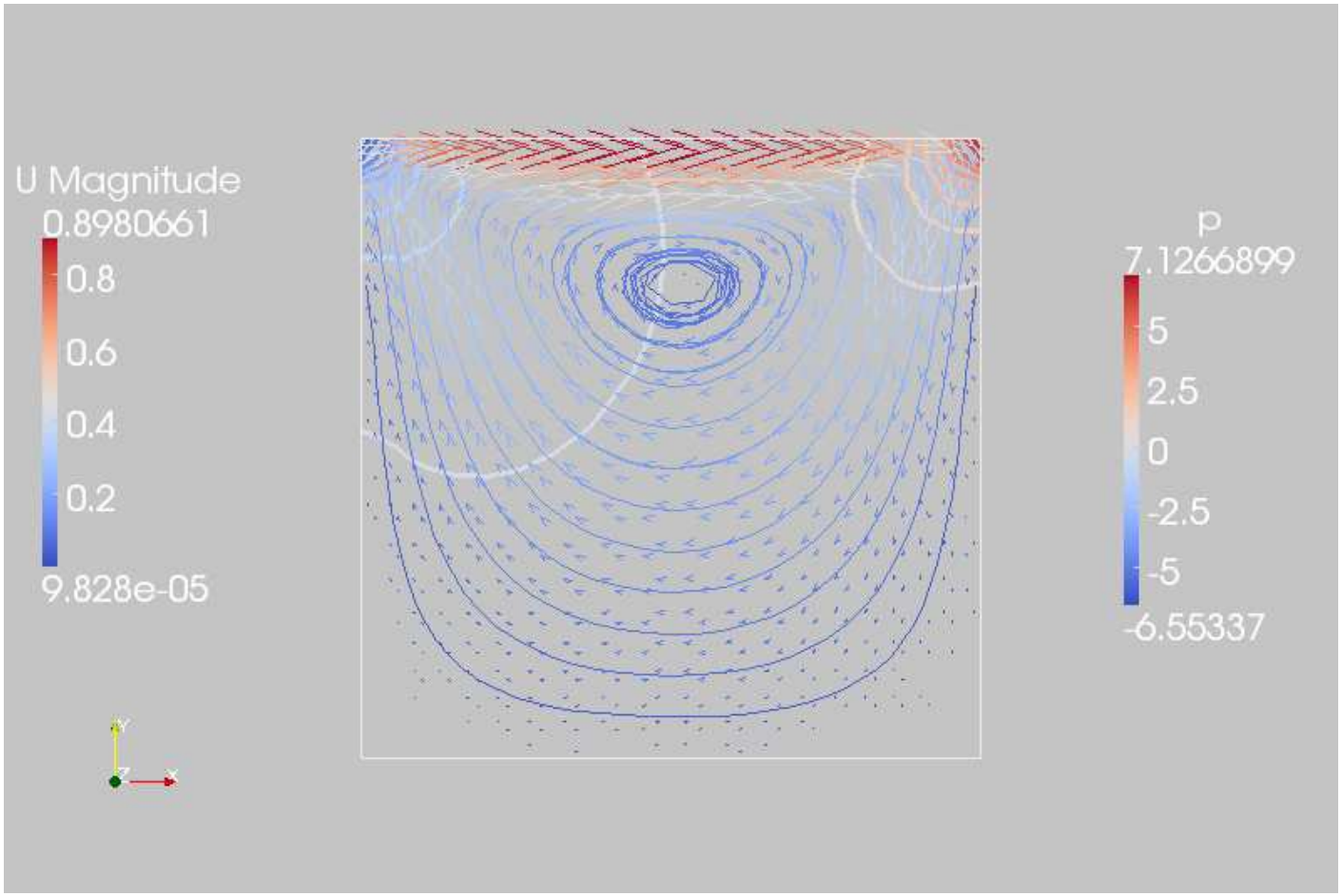

- Isocontours of pressure for cavity (white) and cavityFine (black).
- Velocity of cavityFine plotted as vectors and coloured by magnitude.

# Tutorial: cavityFine



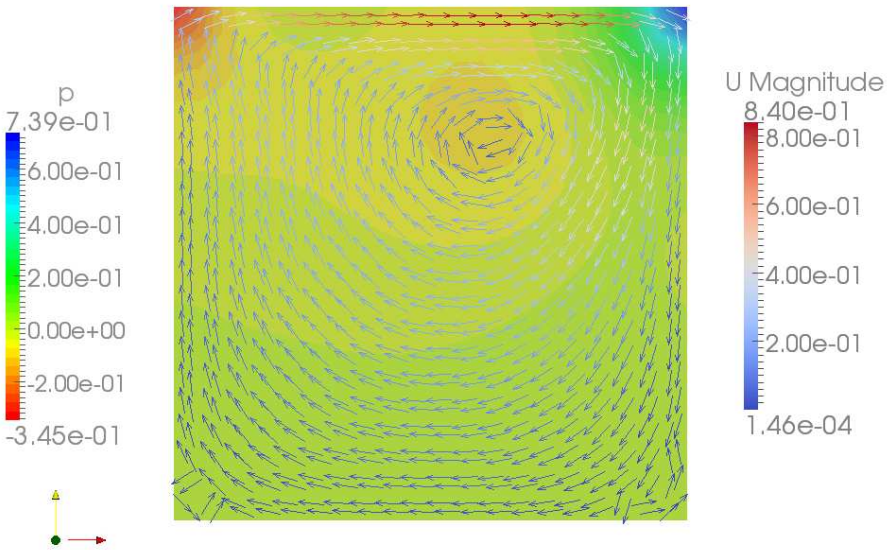

- Horizontal velocity Ux as a function of distance to cavity base.
- Plotted using ParaView with the `plot over line`-filter.

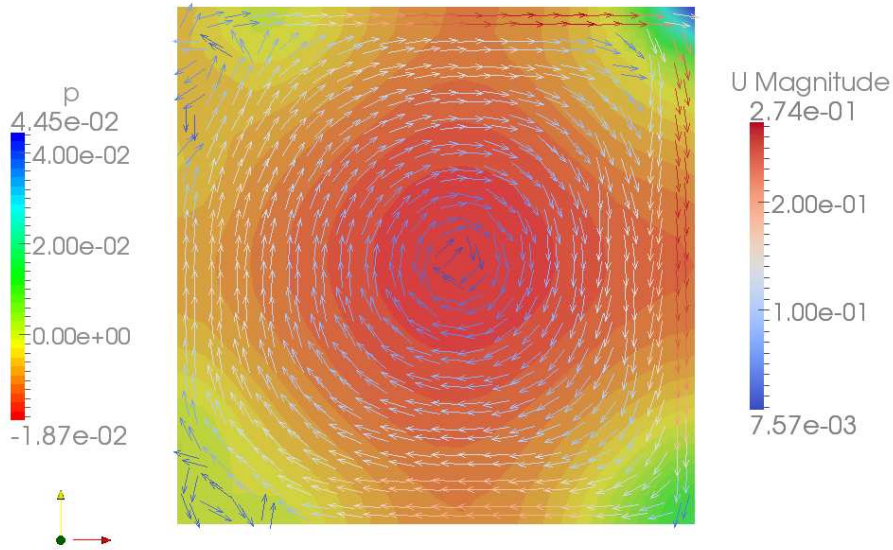
# Tutorial: cavityGrade




- Isocontours of pressure, and streamlines with flow direction indicators coloured by velocity magnitude.

# Tutorial: cavityHighRe



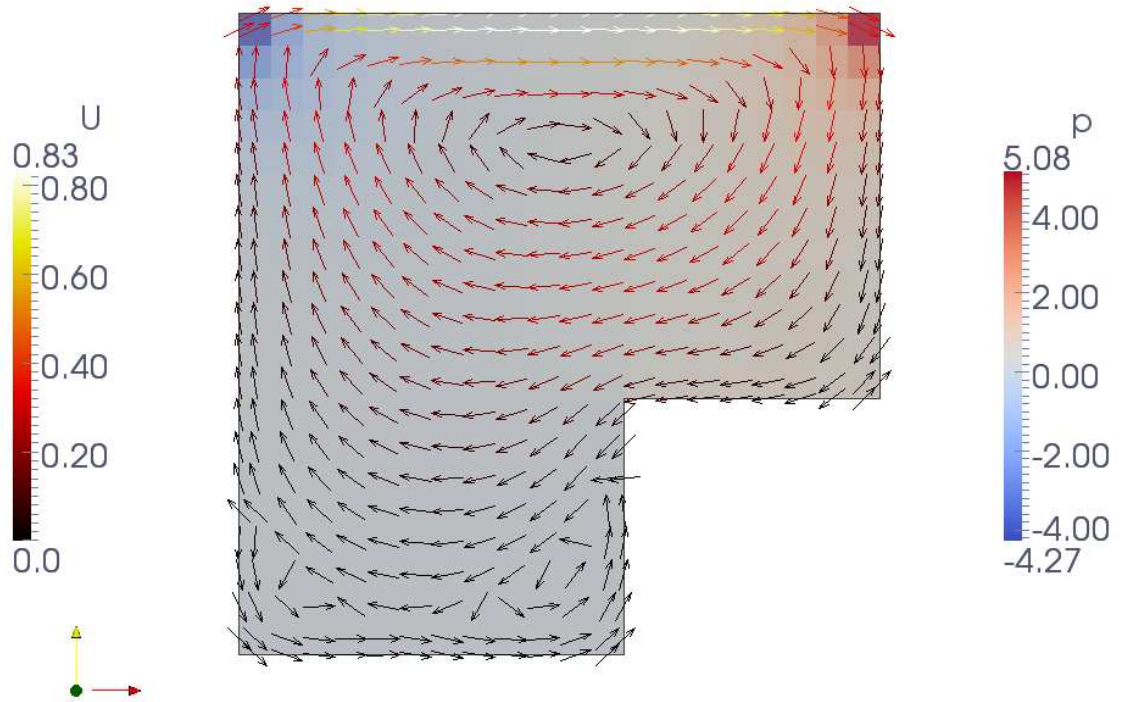




- Reynolds number 100.
- 2 seconds.

- Reynolds number 10000.
- 10 seconds.

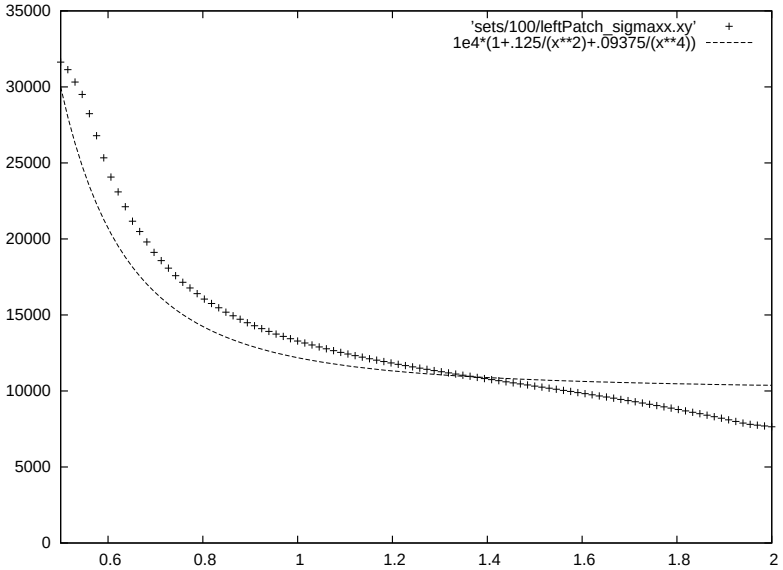
Both cases were solved with `icoFoam` on a coarse mesh.

# Tutorial: cavityClipped

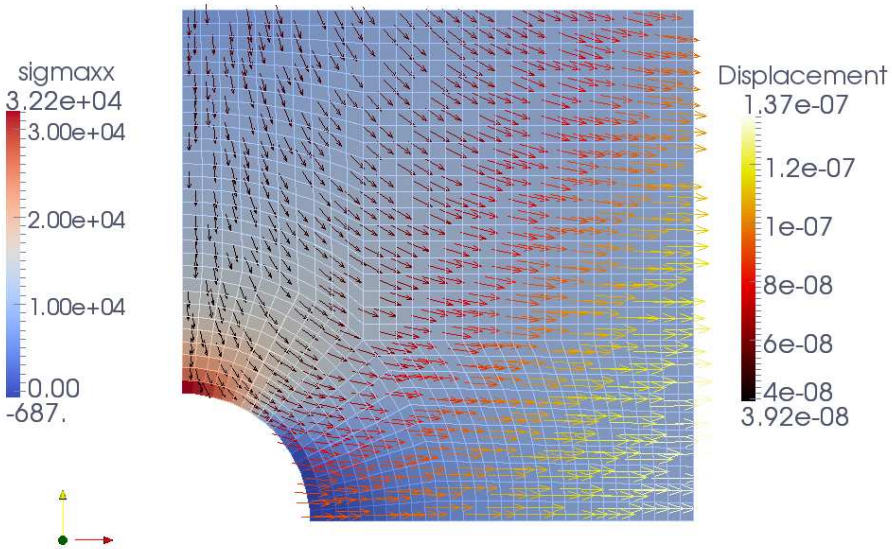



- Clipped corner; map solution from `cavity` to initial condition for `cavityClipped`, then set all fixed-boundary velocities to zero.

# Tutorial: plateHole

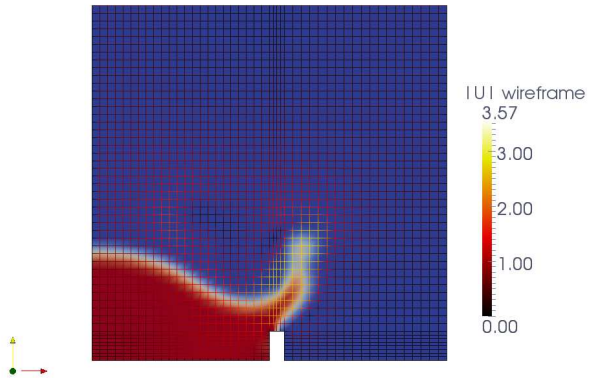



- $\sigma_{xx}$ vs. vertical distance from hole along centerline.
- Analytical and numerical solutions.

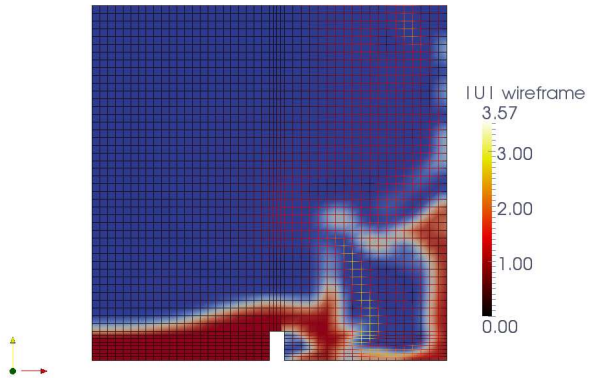



- Coloured by magnitude of $\sigma_{xx}$; includes displacement vectors.

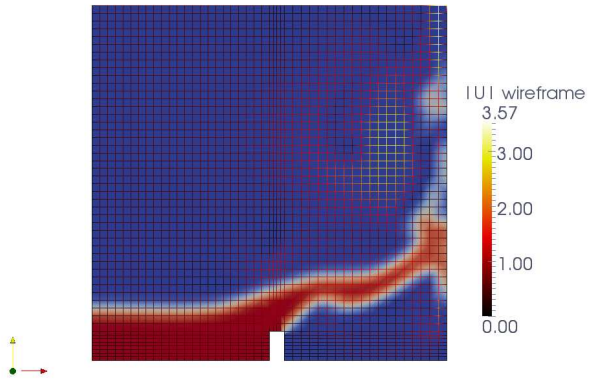
# Tutorial: damBreak



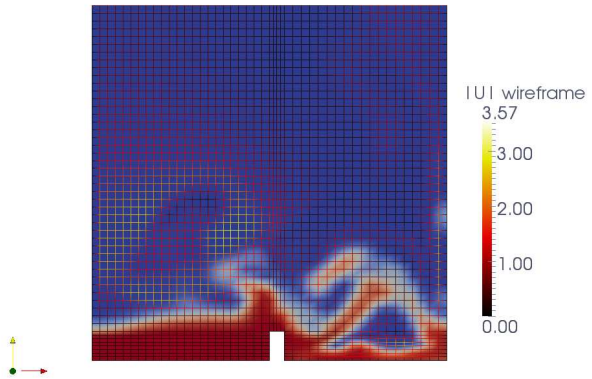

$t = 0.2s$




$t = 0.6s$

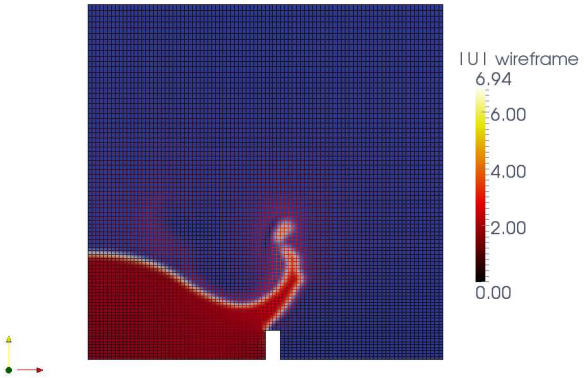



$t = 0.4s$

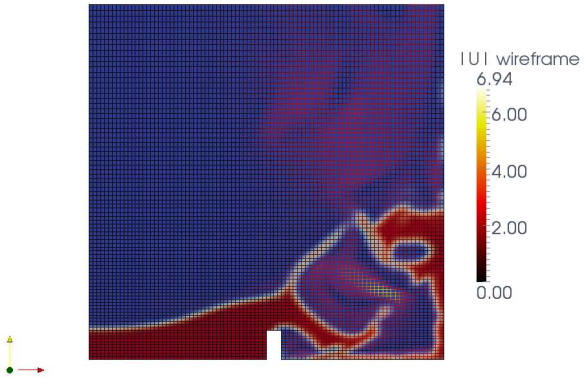



$t = 0.8s$

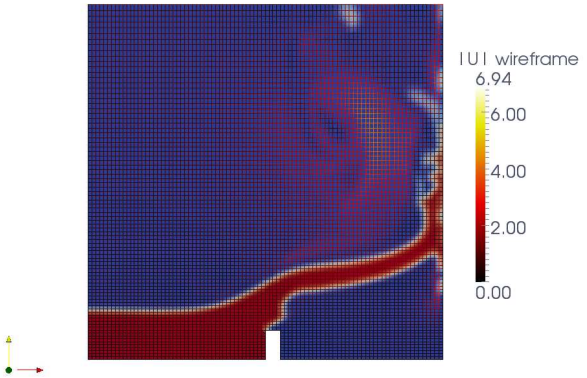
# Tutorial: damBreakFine



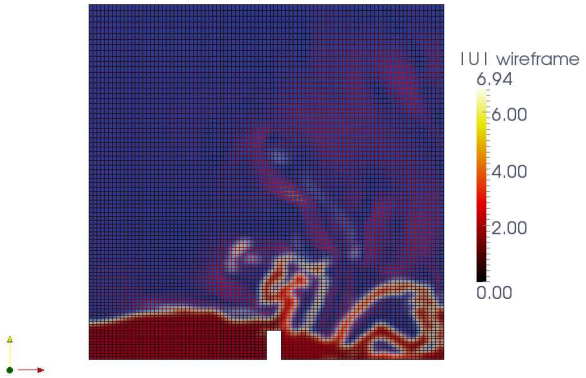

$t = 0.2s$




$t = 0.6s$



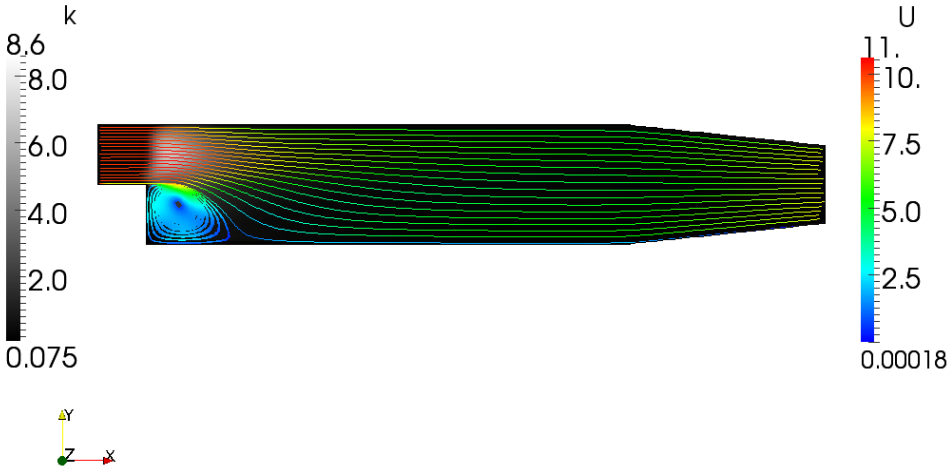

$t = 0.4s$



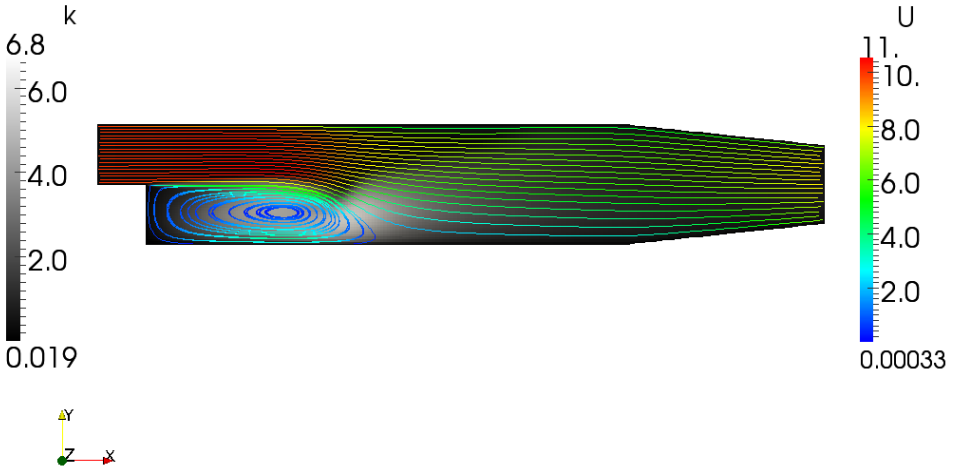

$t = 0.8s$

**Simulation run on 4 processor cores.**

# Tutorial: pitzDaily

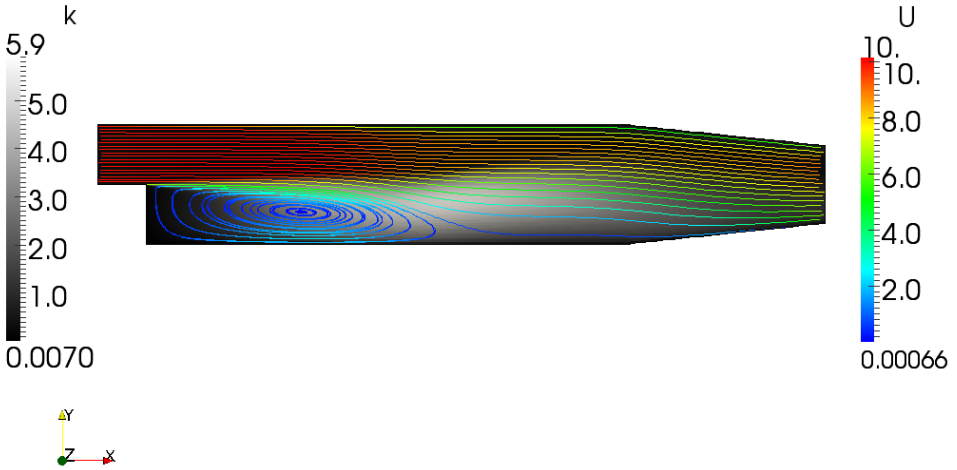



50 steps

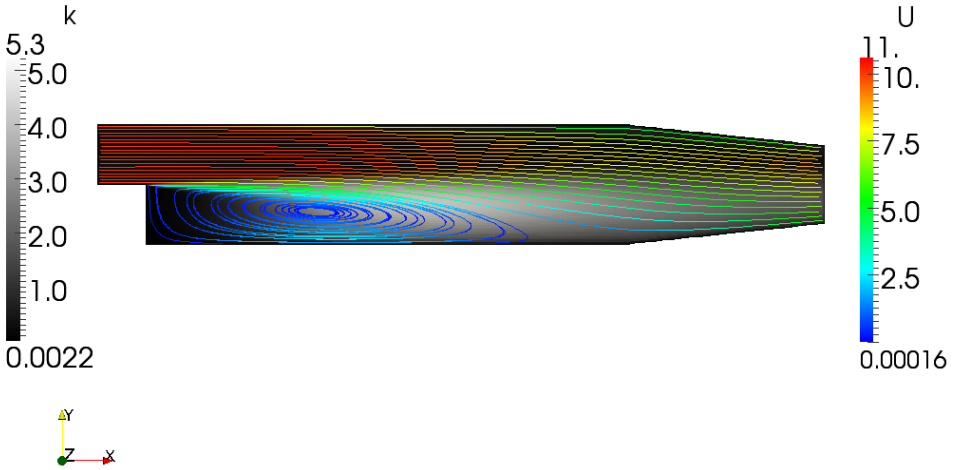



250 steps

# Tutorial: pitzDaily

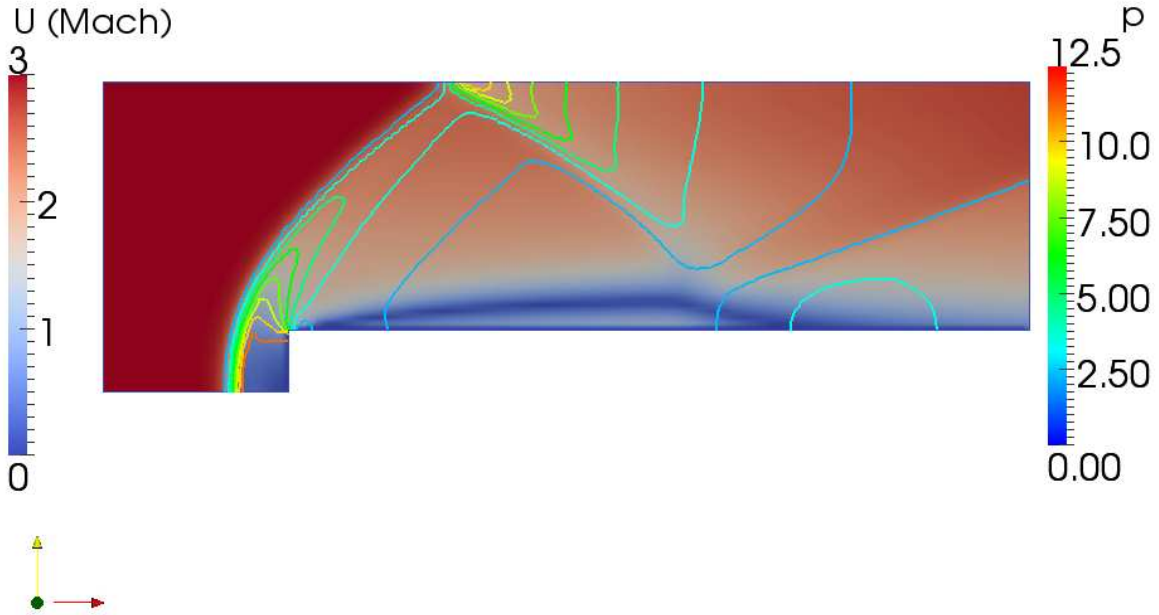



500 steps



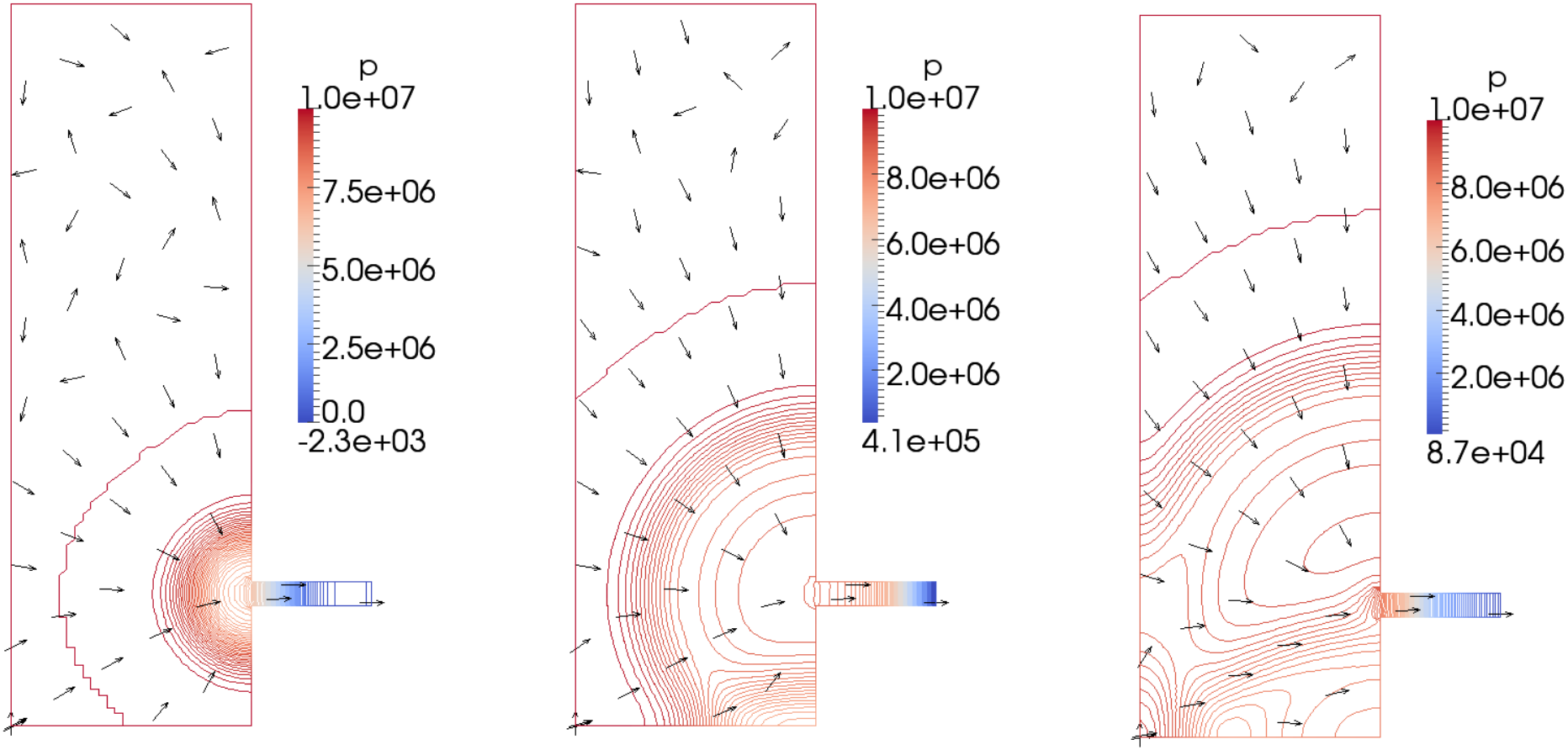

1000 steps

# Tutorial: forwardStep




- Supersonic flow over step. Isocontours of pressure; fluid velocity distribution.

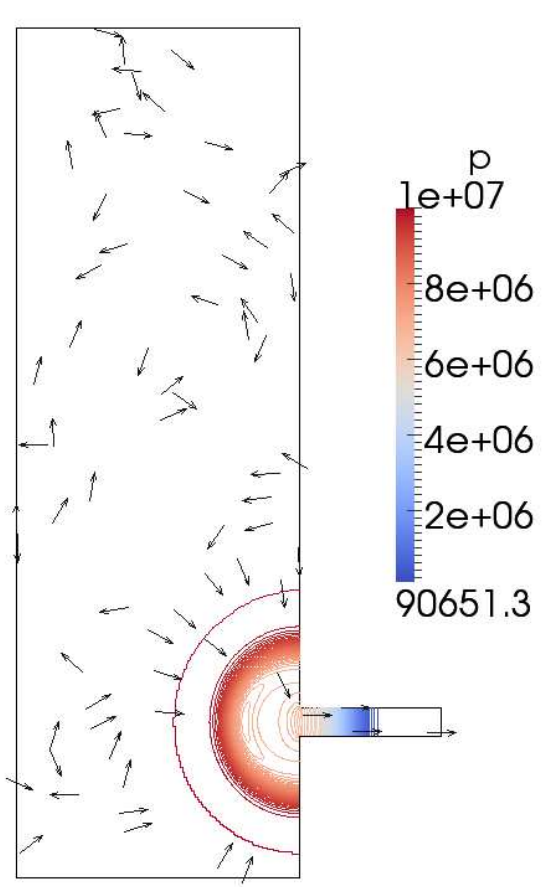
# Tutorial: decompressionTank



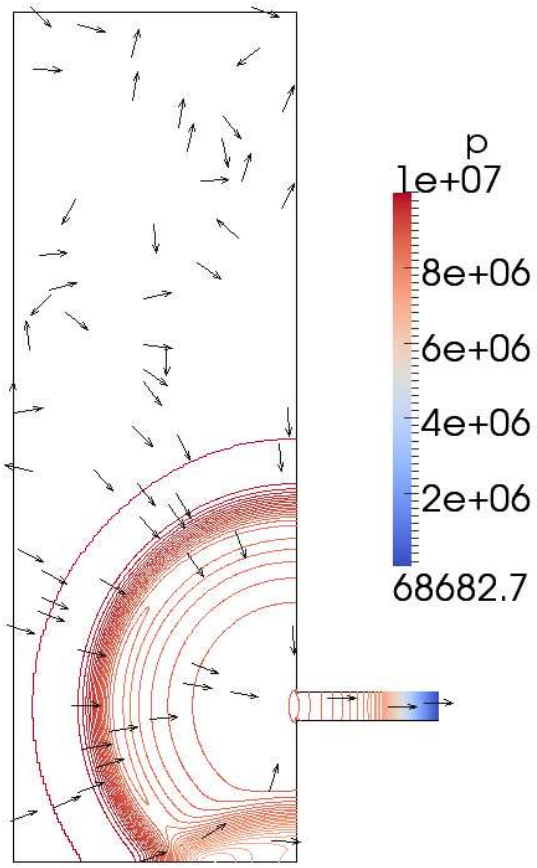

$t = 50\ \mu$s $t = 80\ \mu$s $t = 100\ \mu$s

Pressure contours and fluid velocity vectors.

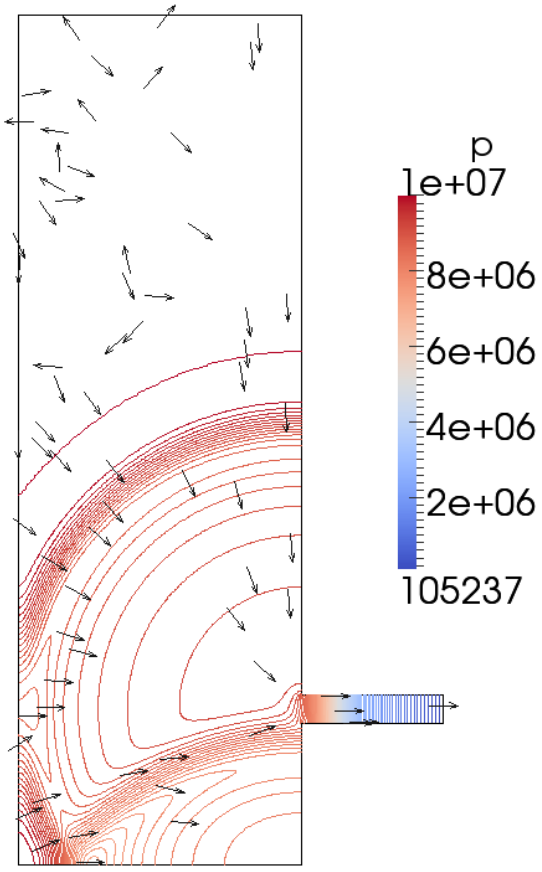
# Tutorial: decompressionTankFine




$t = 50\ \mu$s



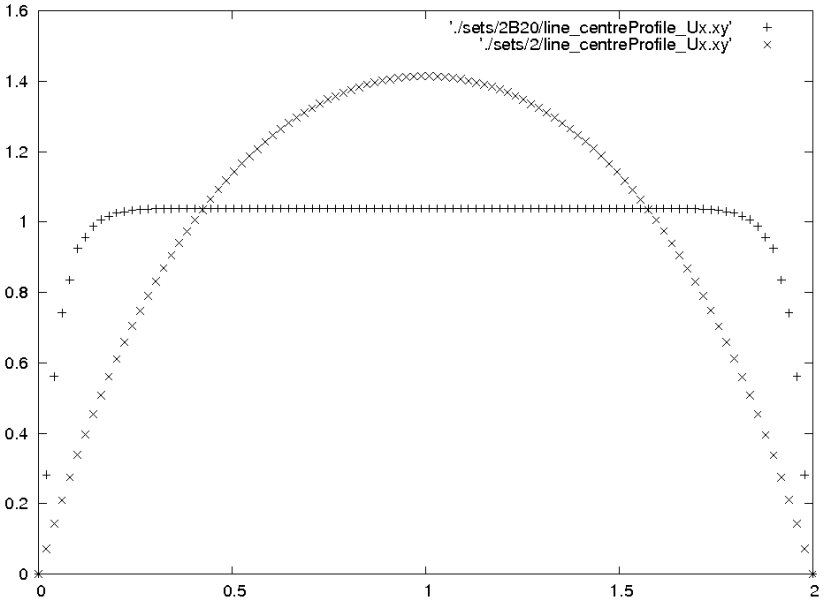

$t = 80\ \mu$s



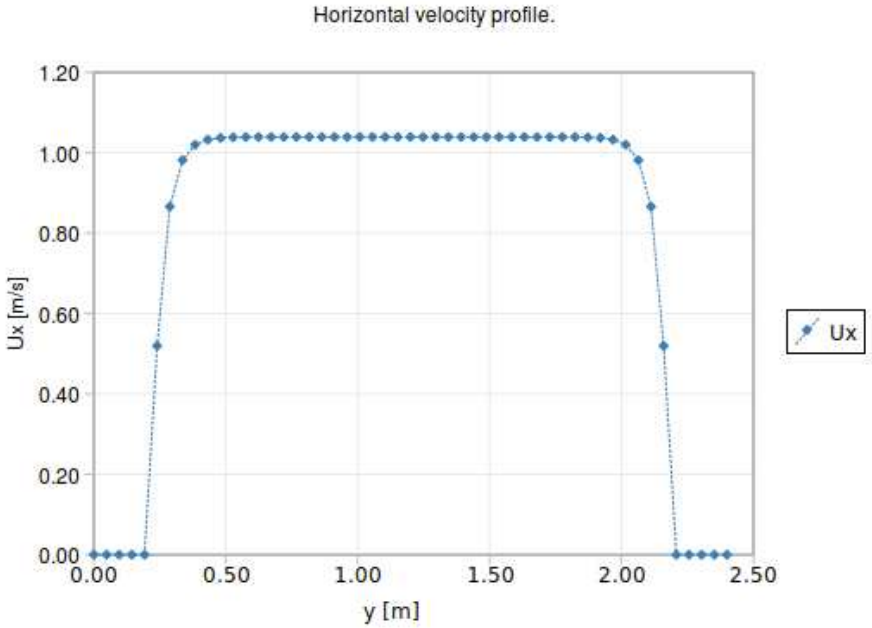

$t = 100\ \mu$s

Pressure contours and fluid velocity vectors. Fine mesh.

# Tutorial: hartmann



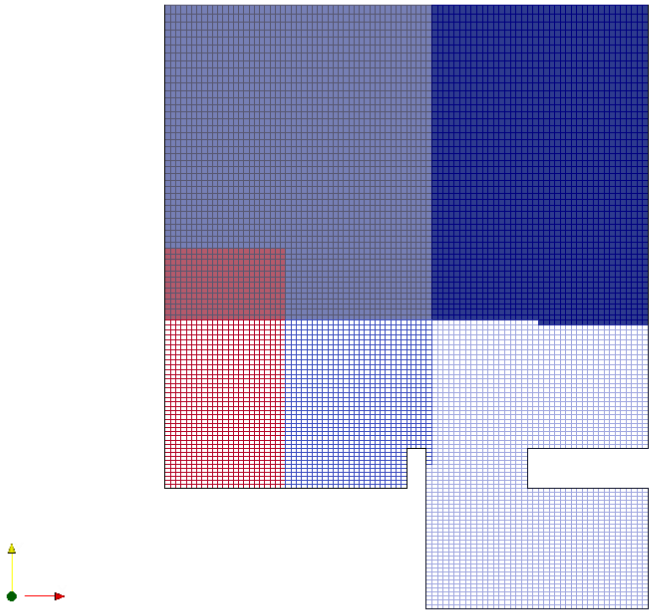

- Velocity profile at two different magnetic field strengths (+ $B = 20$T; x $B = 2$T)
- `GNUplot plot using sample` utility.




- ParaView `plot-over-line` filter of velocity with $B = 20$T

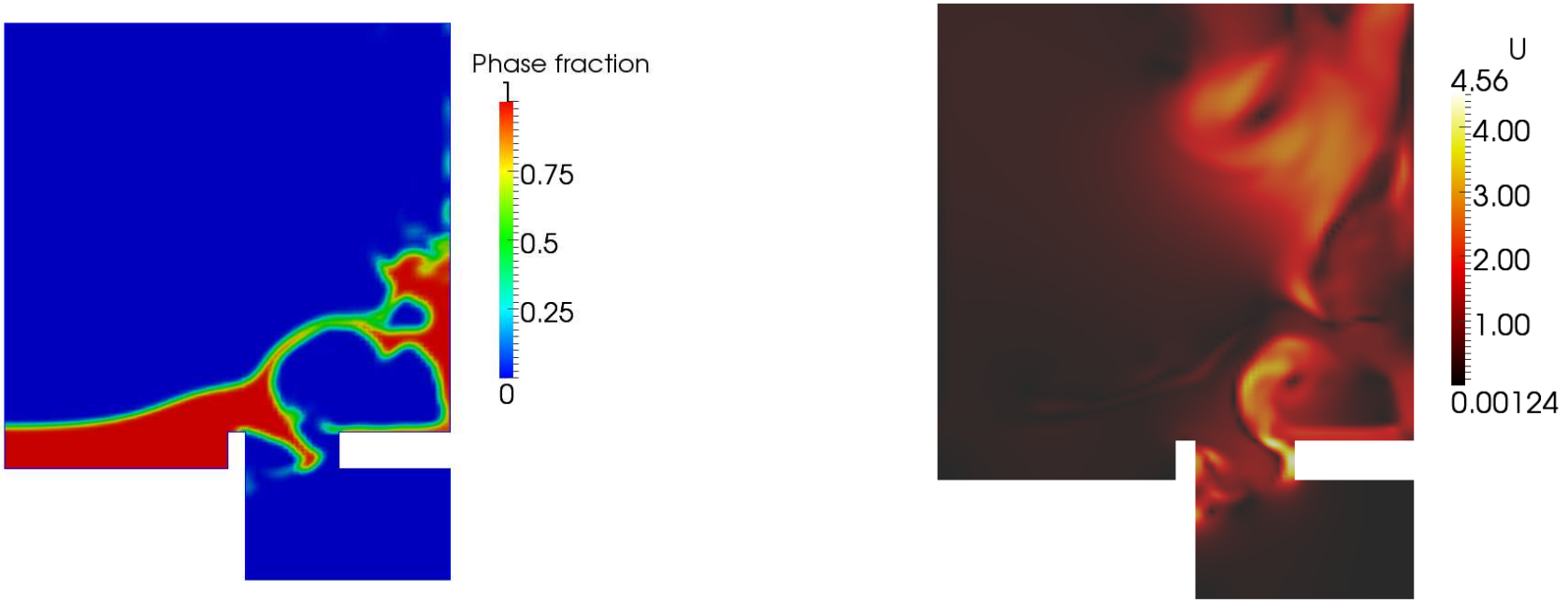
# Modified tutorial: damBreakFine

- Problem identical to the `damBreakFine`-problem with different geometry.
- Processed in parallel on 4 cores.
- Mesh and core partitioning with initial $\alpha$-distribution in red.
- Cell partitioning of new blocks computed to comply with cell sizes from `damBreakFine` tutorial.



# Modified tutorial: damBreakFine

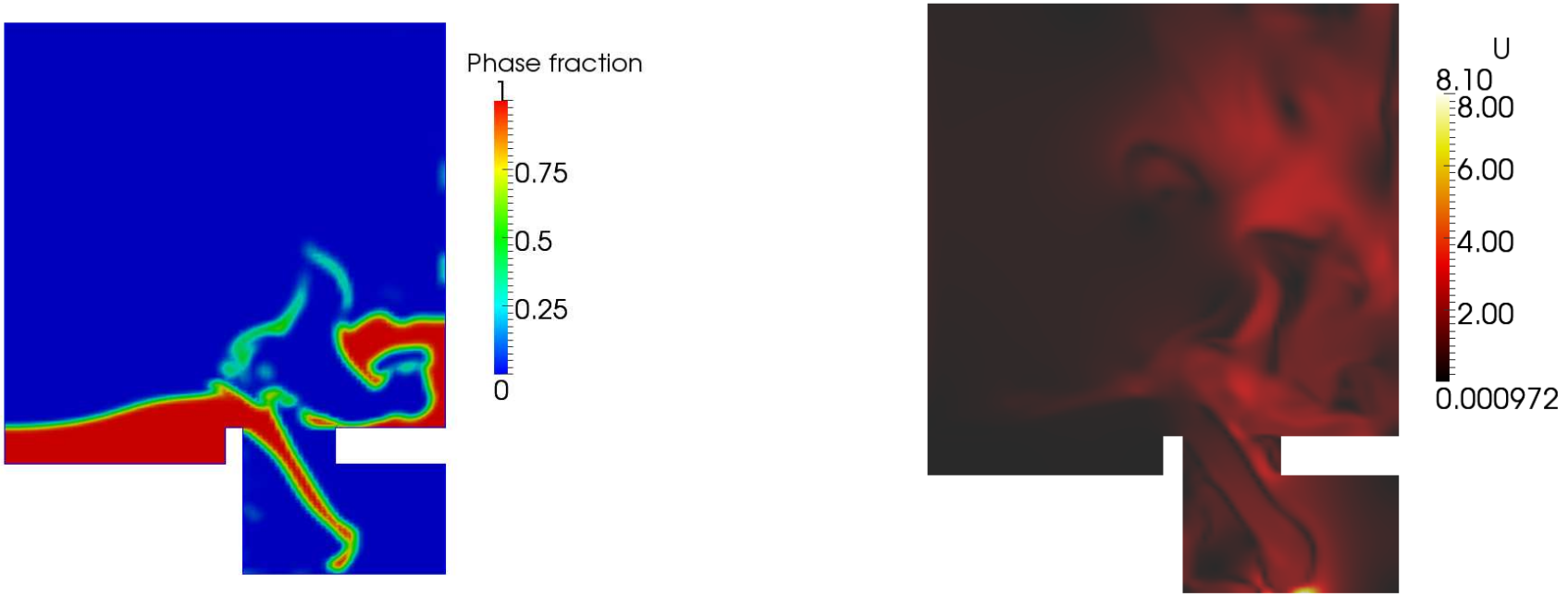
Velocity and phase fraction plots.




$t = 0.55s$

# Modified tutorial: damBreakFine

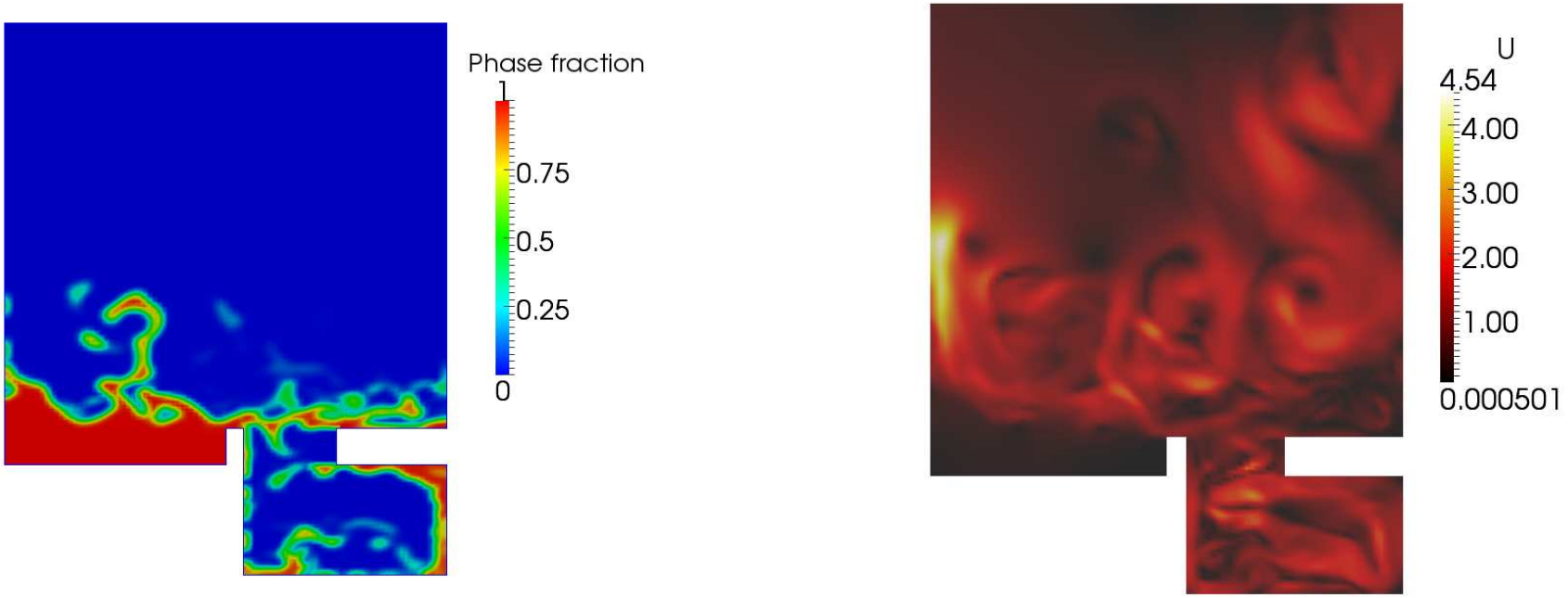
Velocity and phase fraction plots.




$t = 0.65s$

# Modified tutorial: damBreakFine

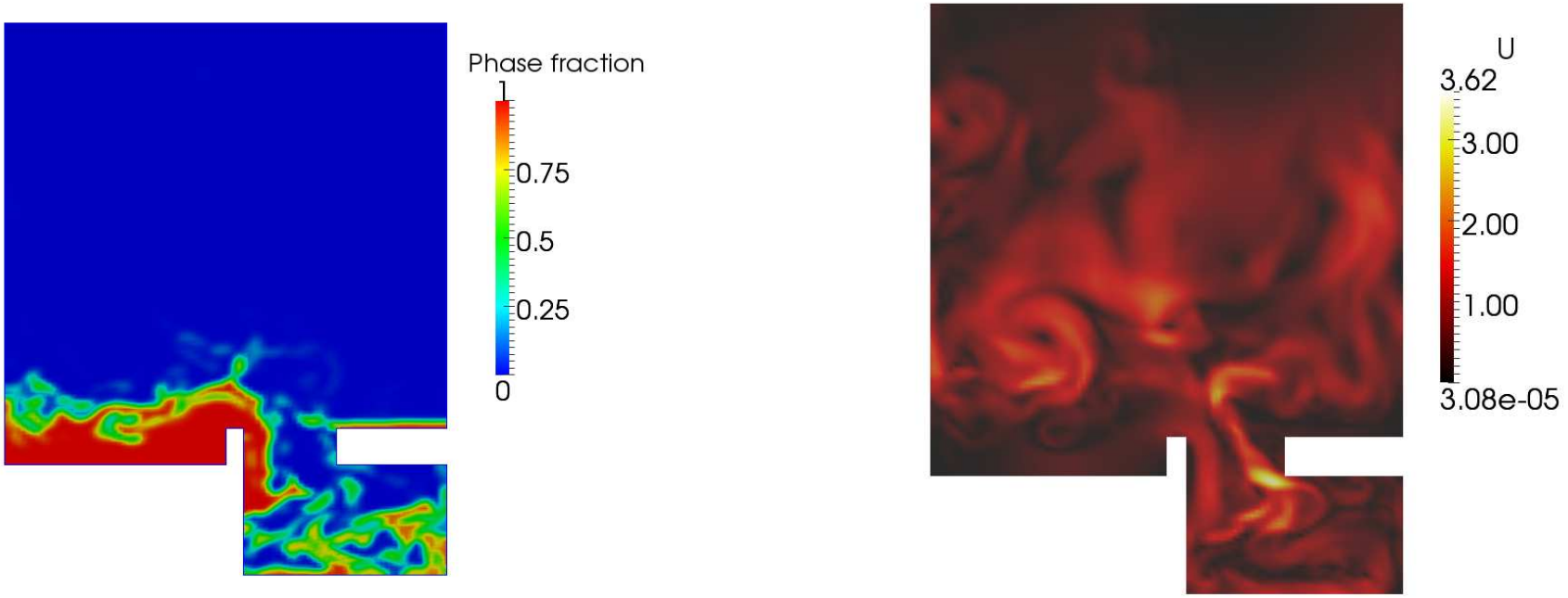
Velocity and phase fraction plots.




$t = 0.90s$

# Modified tutorial: damBreakFine

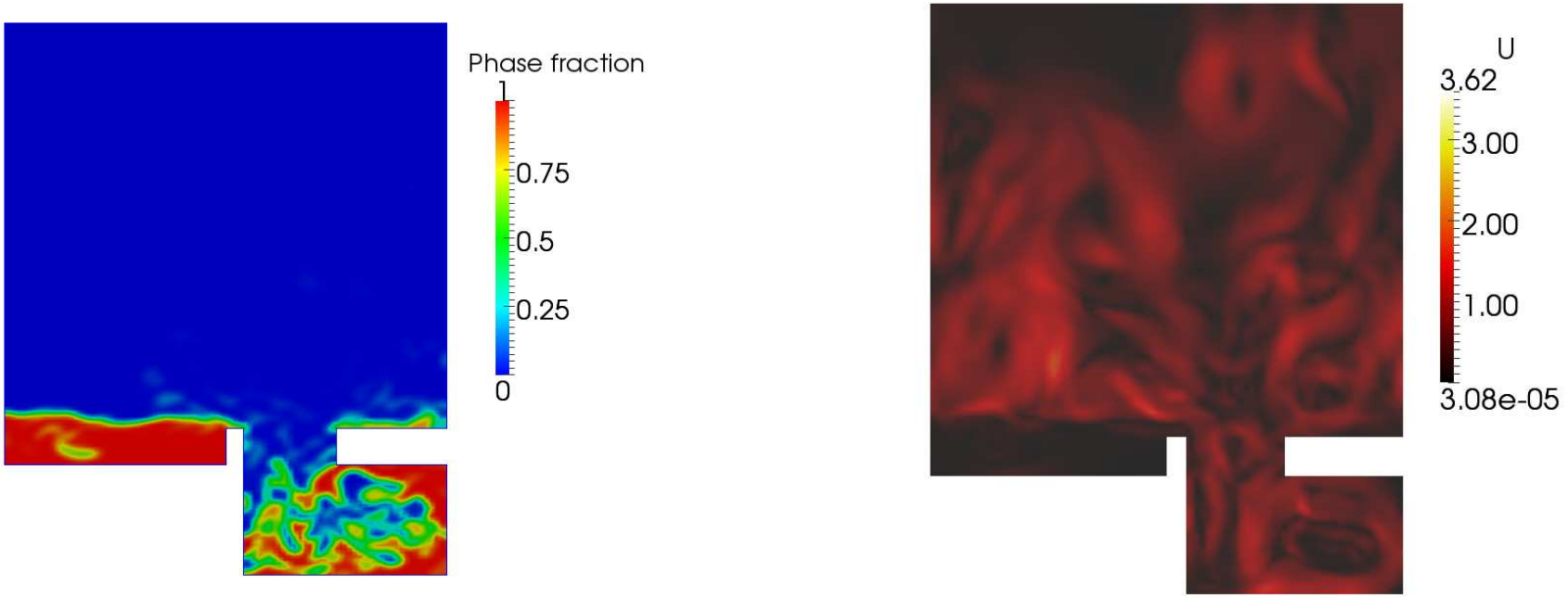
Velocity and phase fraction plots.




$t = 1.40s$

# Modified tutorial: damBreakFine

Velocity and phase fraction plots.




$t = 2.00s$