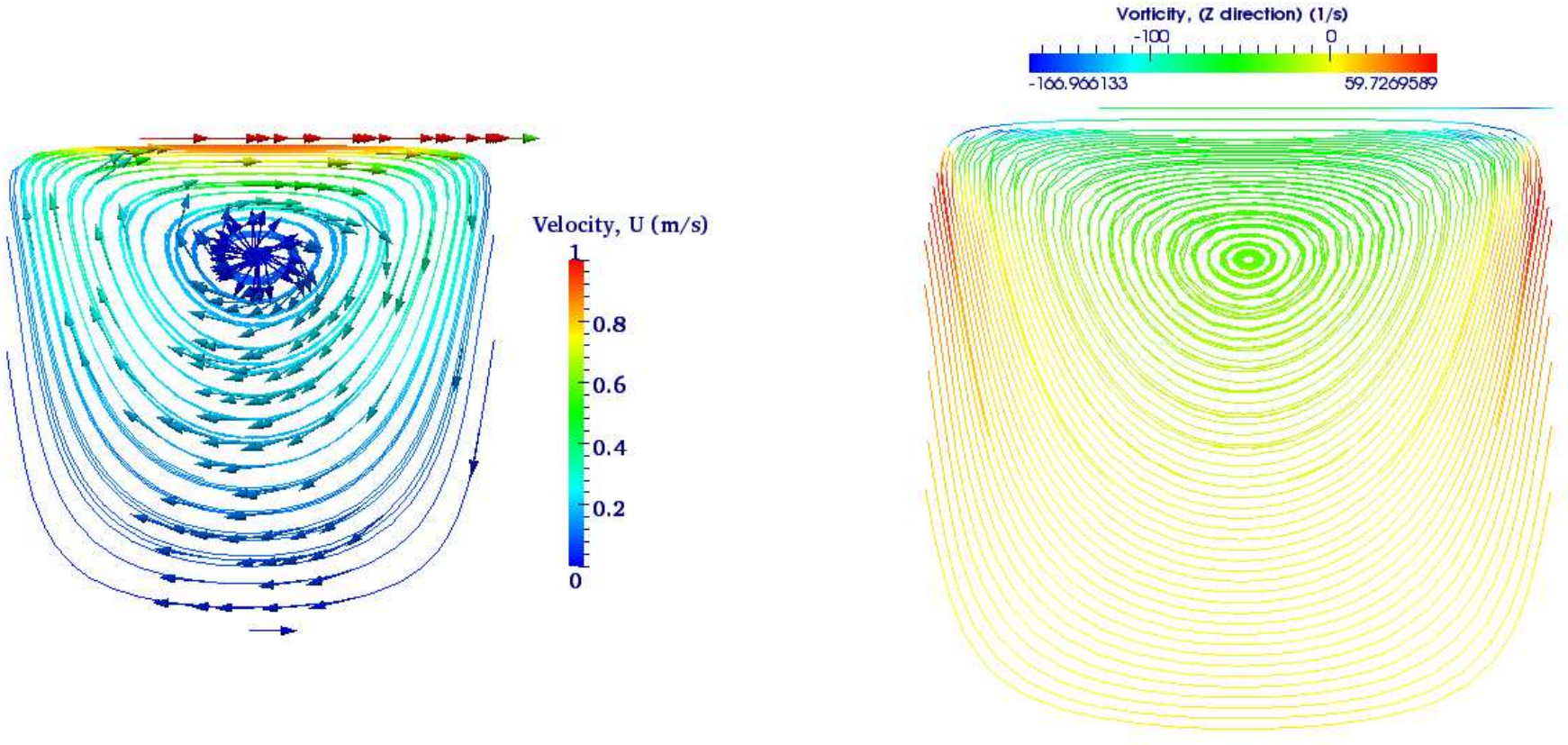
MSc/PhD course in CFD with OpenSource software, 2011

Cavity Case

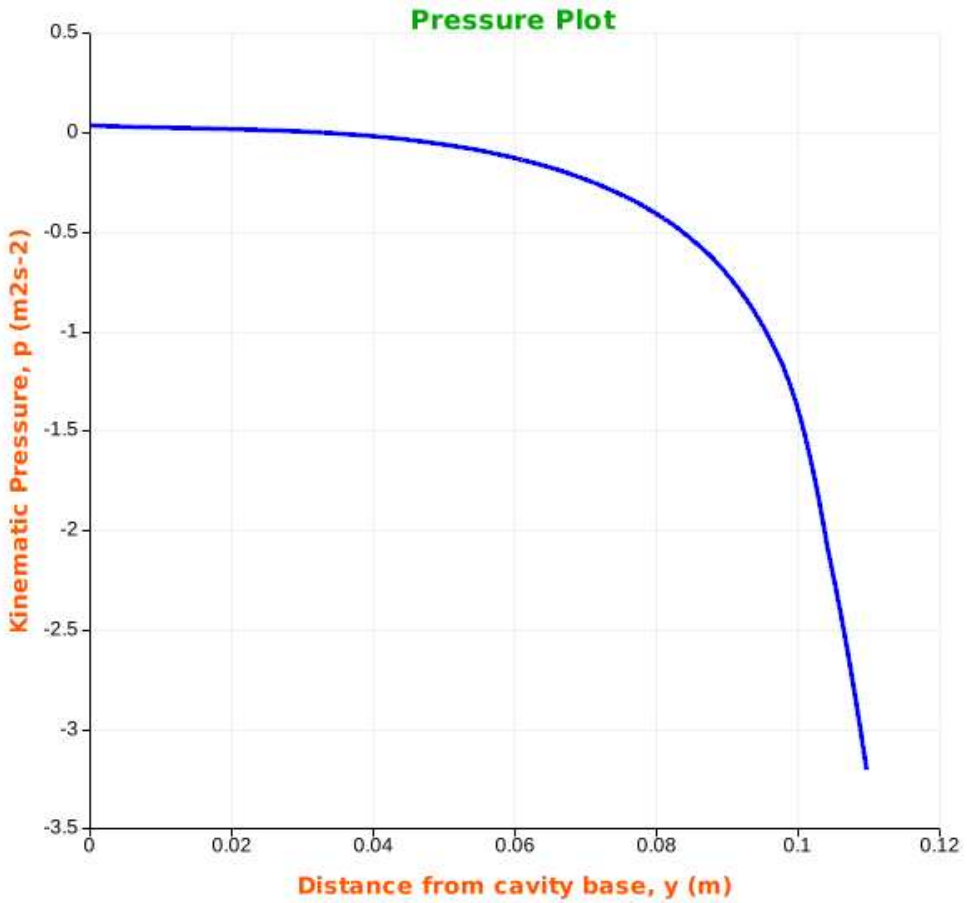


(a) Velocity magnitude and streamline

(b) Vorticity magnitude

Figure 1: Velocity magnitude and streamline, Right-Vorticity magnitude

Cavity Case



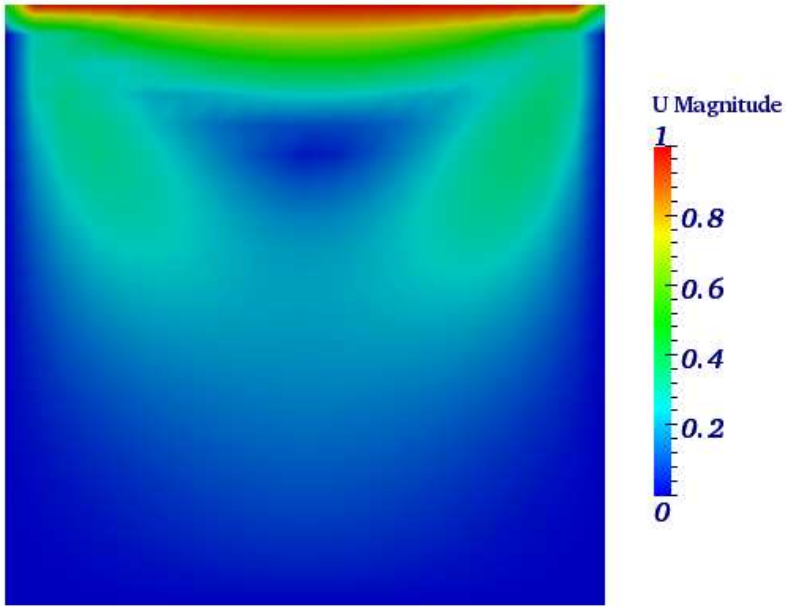


Figure 2: pressure plot, Right-U magnitude

Cavity Clipped Case

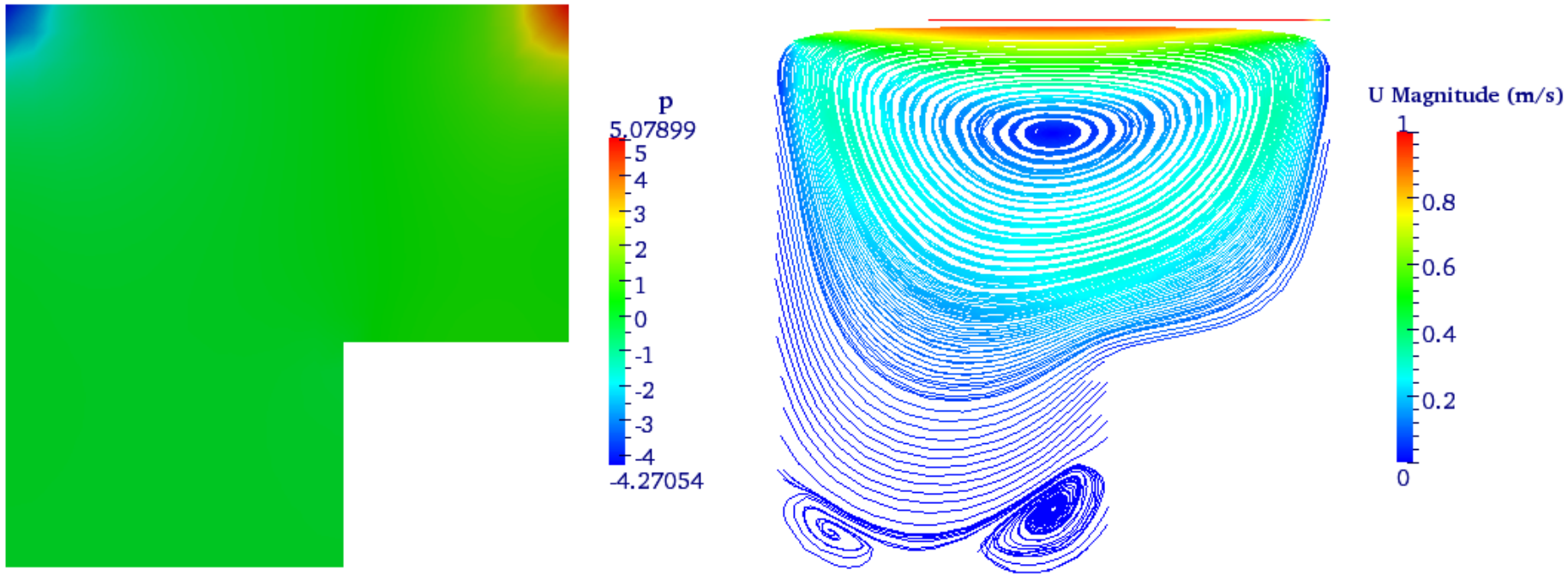


Figure 3: Left-pressure distribution, Right-velocity magnitude and streamline

Cavity Fine Case

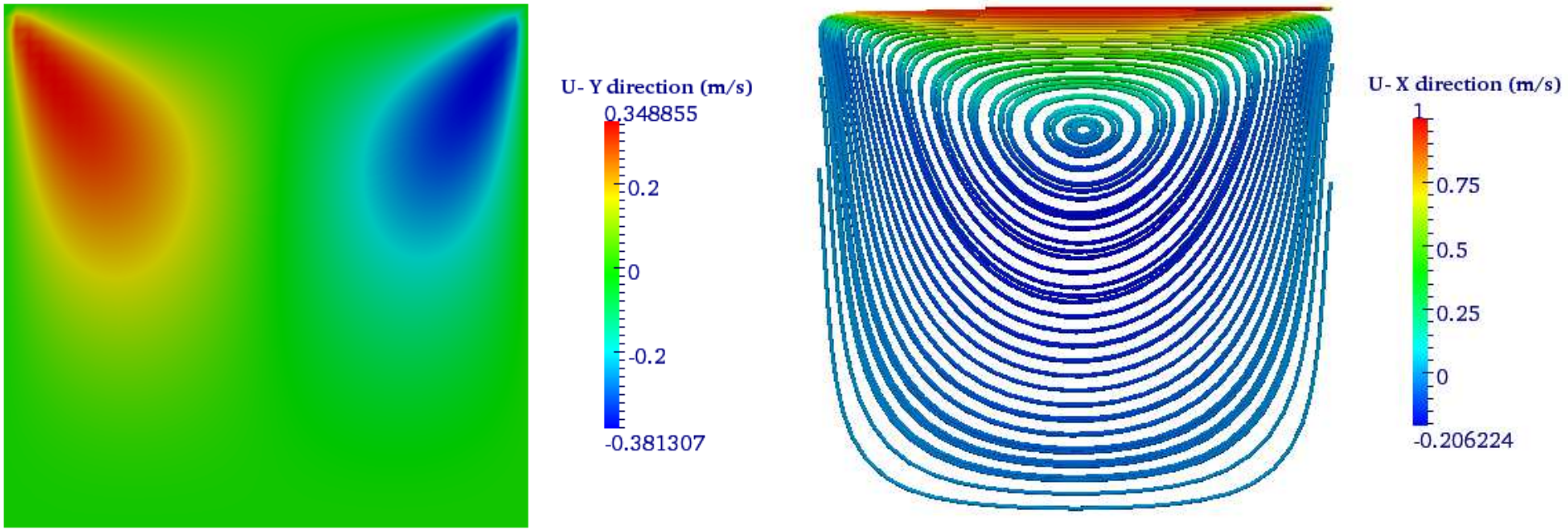
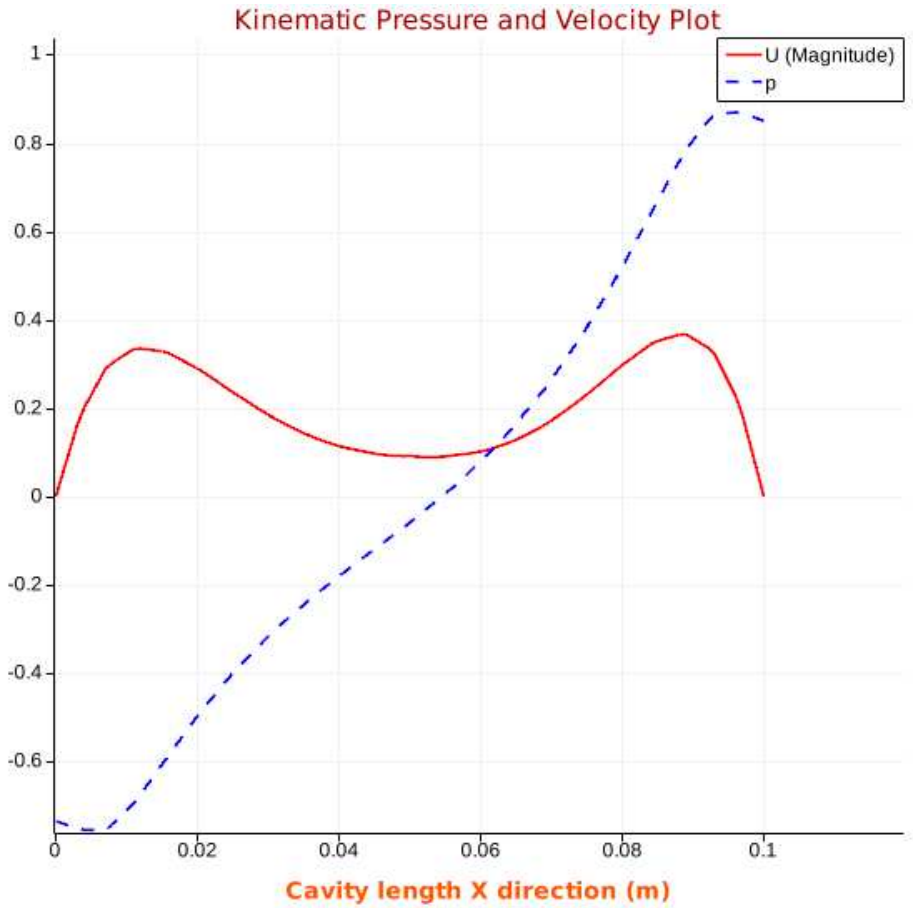


Figure 4: Left- V_y distribution , Right-V_x stream tube

Cavity Grade Case



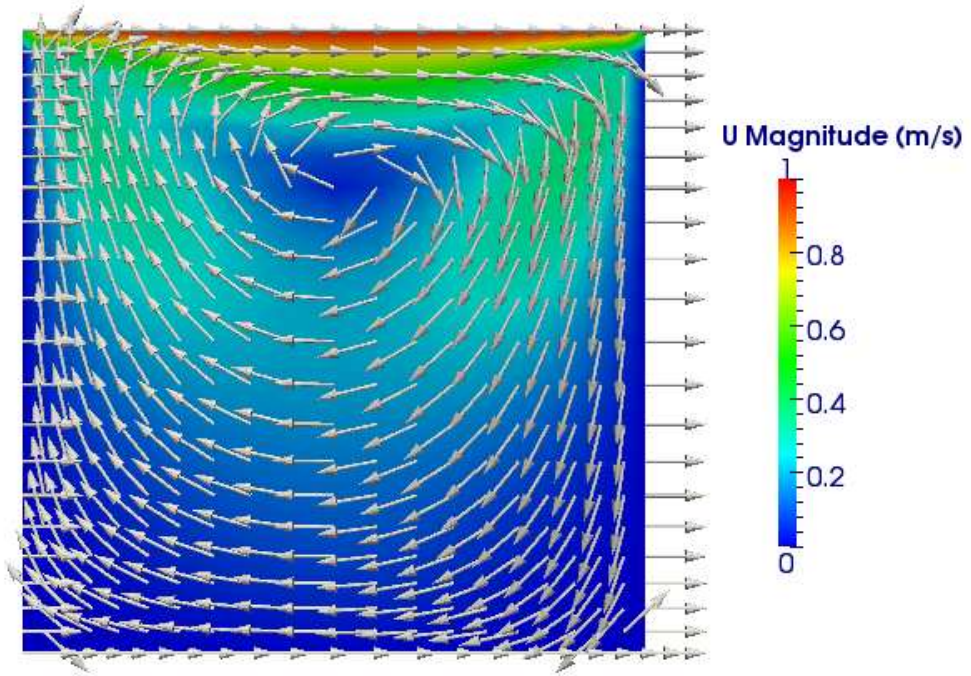


Figure 5: Left-Pressure and velocity plot , Right-Velocity magnitude and streamline

Cavity High Re Case

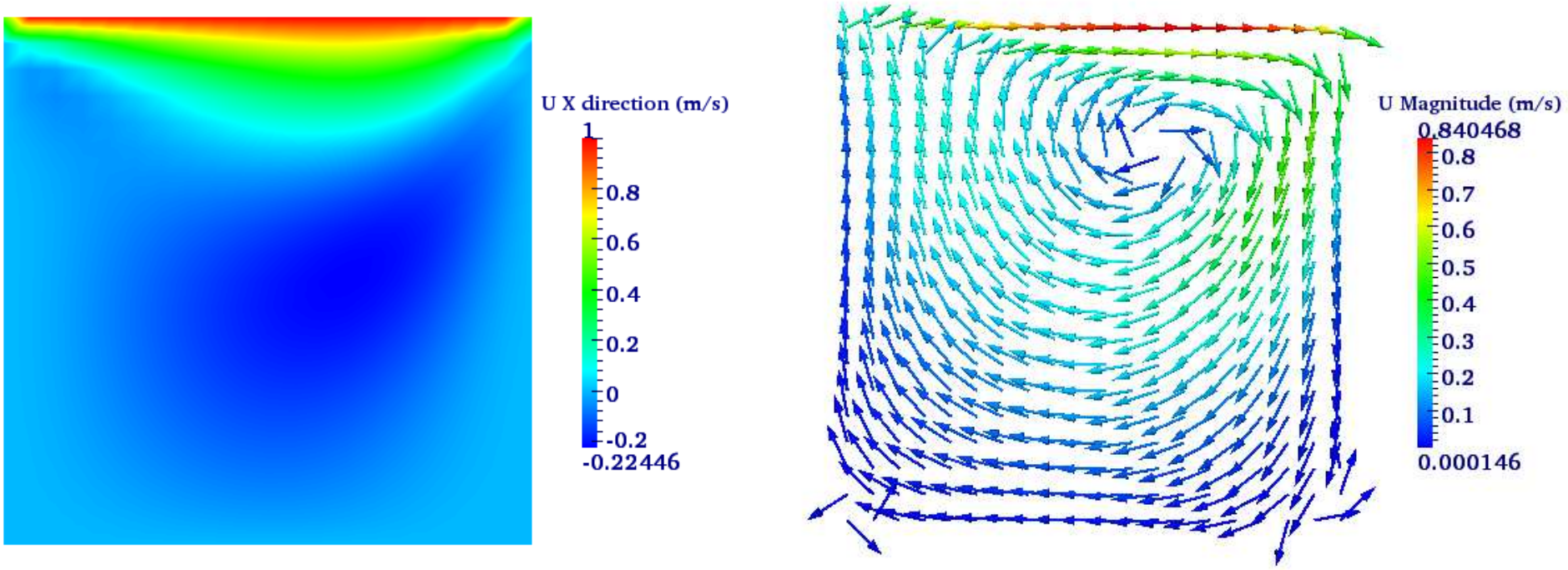


Figure 6: Left-V_x distribution, Right-Velocity vectors

damBreak Case

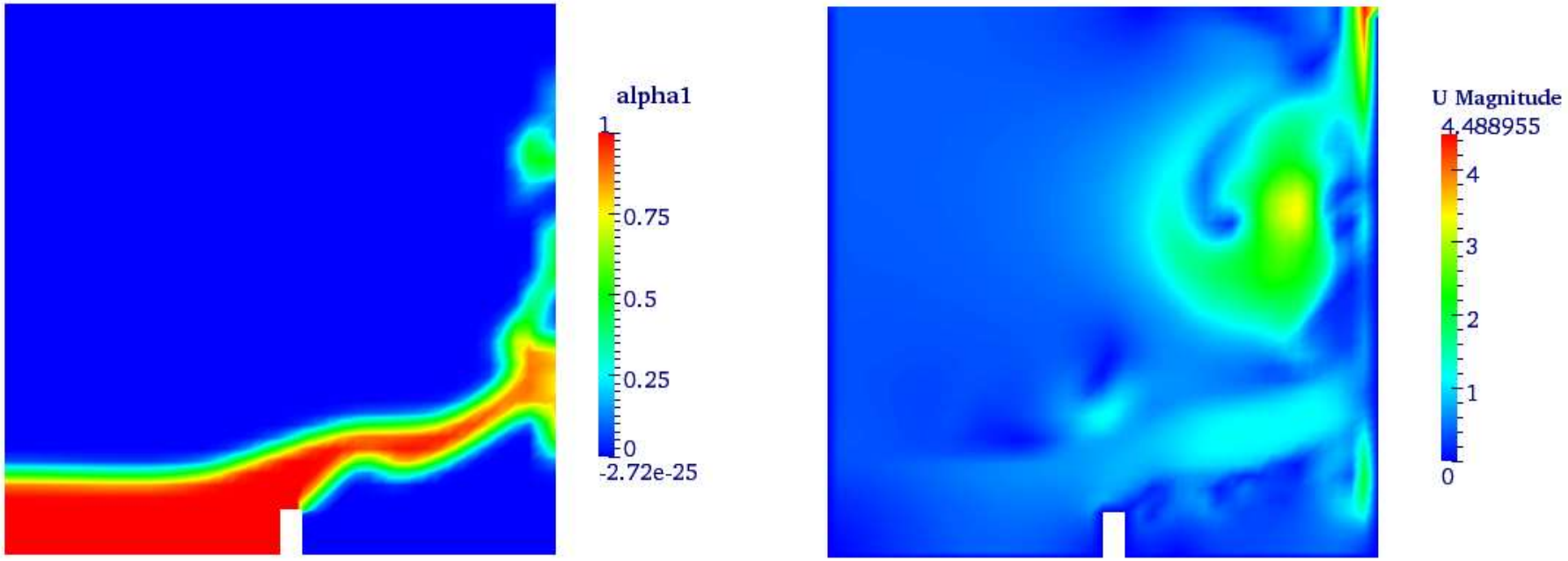


Figure 7: Left-Phases distribution at $t = 0.4s$, Right-Velocity distribution at $t = 0.4s$

damBreakFine Case

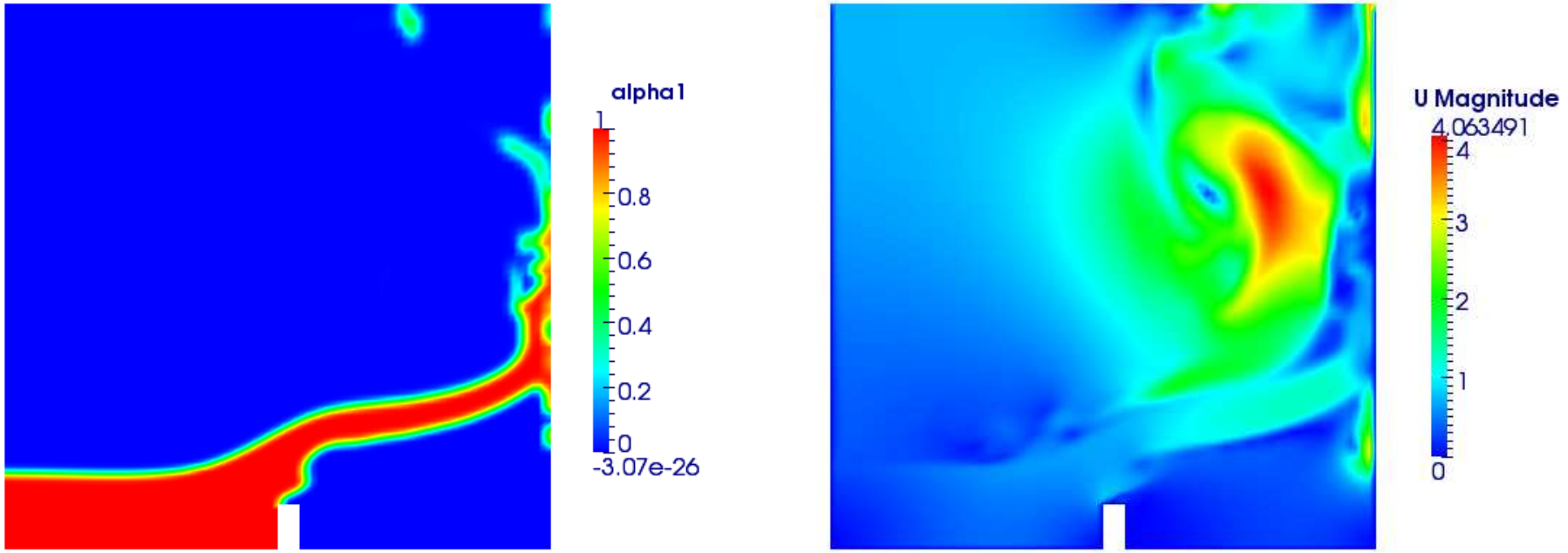


Figure 8: Left-Phases distribution at $t = 0.4s$, Right-Velocity distribution at $t = 0.4s$

pitzdaily Case

Figure 9: Left to Right-Turbulent kinetic energy at 1st and 4th time step

pitzdaily Case

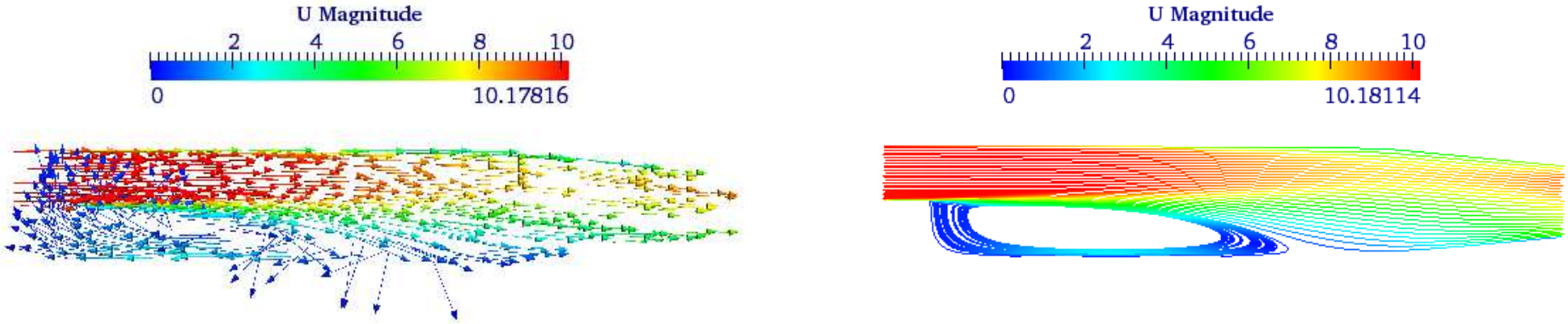


Figure 10: Left-Velocity vectors, Right-Velocity magnitude and streamline

The flowType utility

- This utility calculates and writes the flowType of velocity field U.
- The flow type parameter is obtained according to the following equation:

$$\lambda = \frac{|\,D\,| - |\,\omega\,|}{|\,D\,| + |\,\omega\,|}$$

where D and ω denote `symm(gradU)` and `skew(gradU)`, respectively.

- It states if the flow is rotational (λ = -1), simple shear flow (λ = 0) or planar extensional flow (λ = 1).
- It must be run within the case directory:
  `flowType`
- Usage (`flowType -help`, version independent):

```
flowType [-dict dictionary name] [-latest time] [-time ranges]
[-parallel] [-constant] [-noZero] [-noWrite] [-case dir] [-help]
[-doc] [-srcDoc]
```

flowType utility

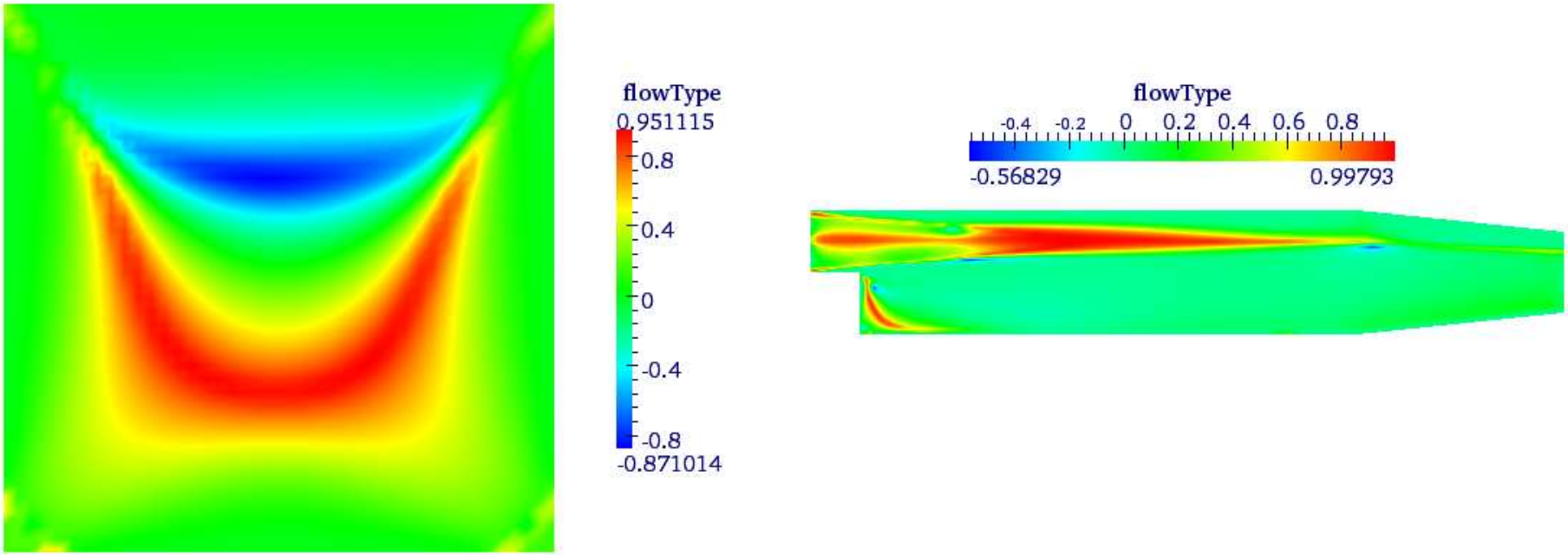


Figure 11: Left-Flow type cavityFine case, Right-Flow type pitzdaily case