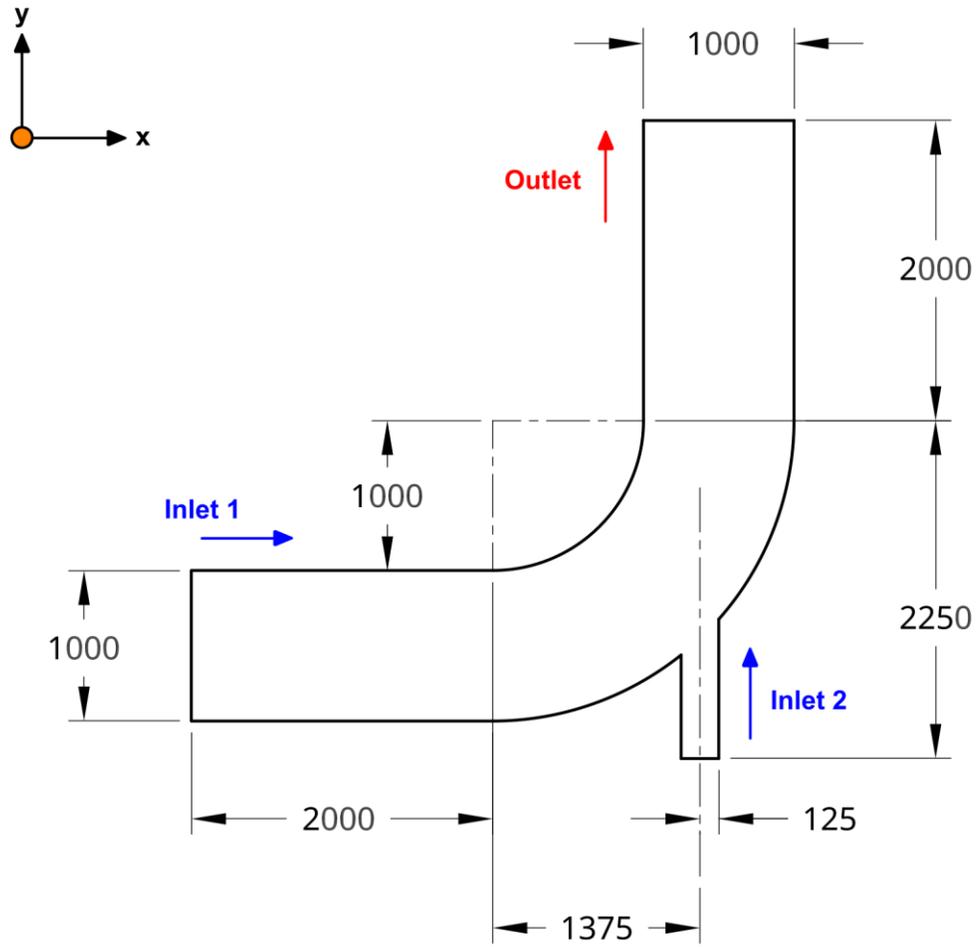


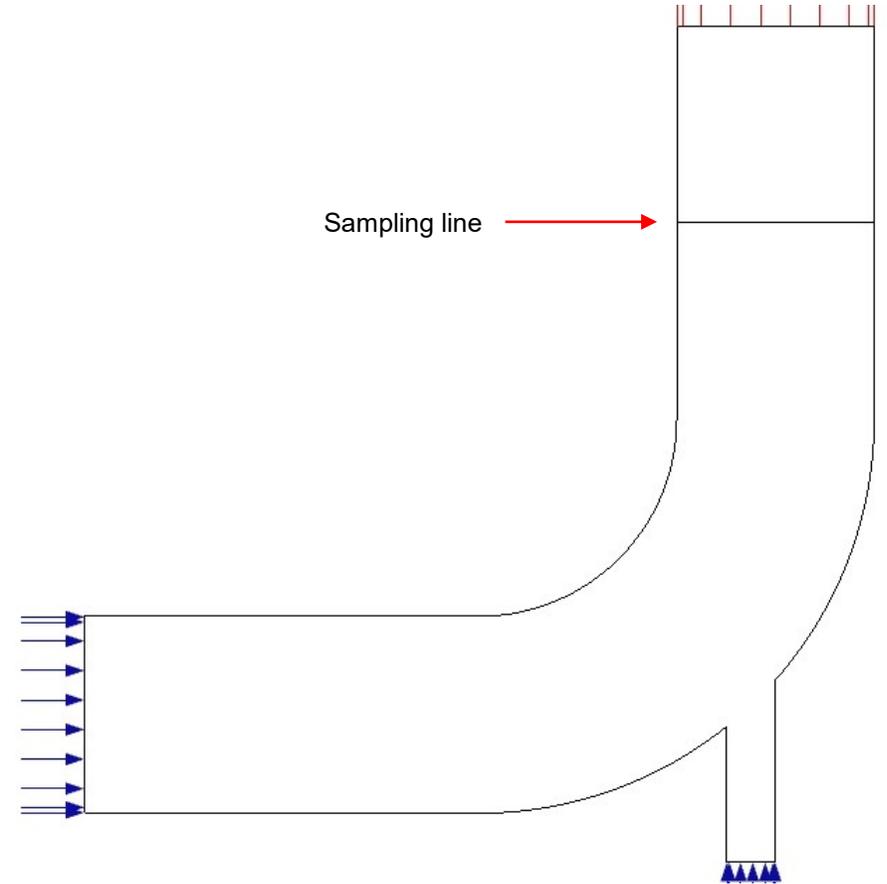
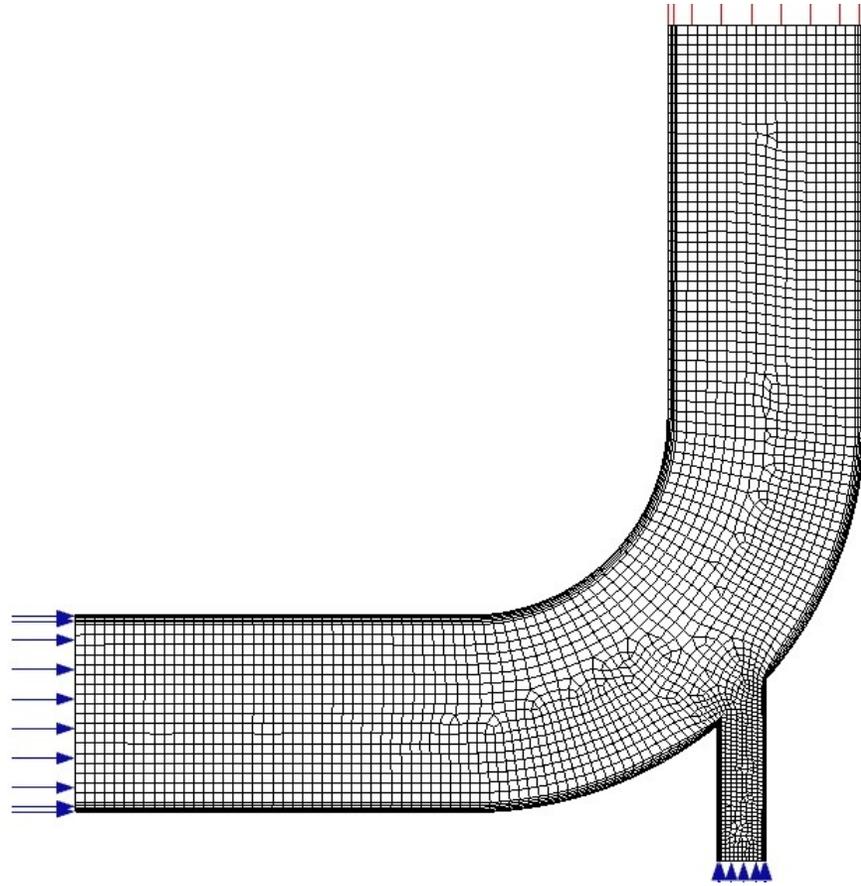
Problem definition



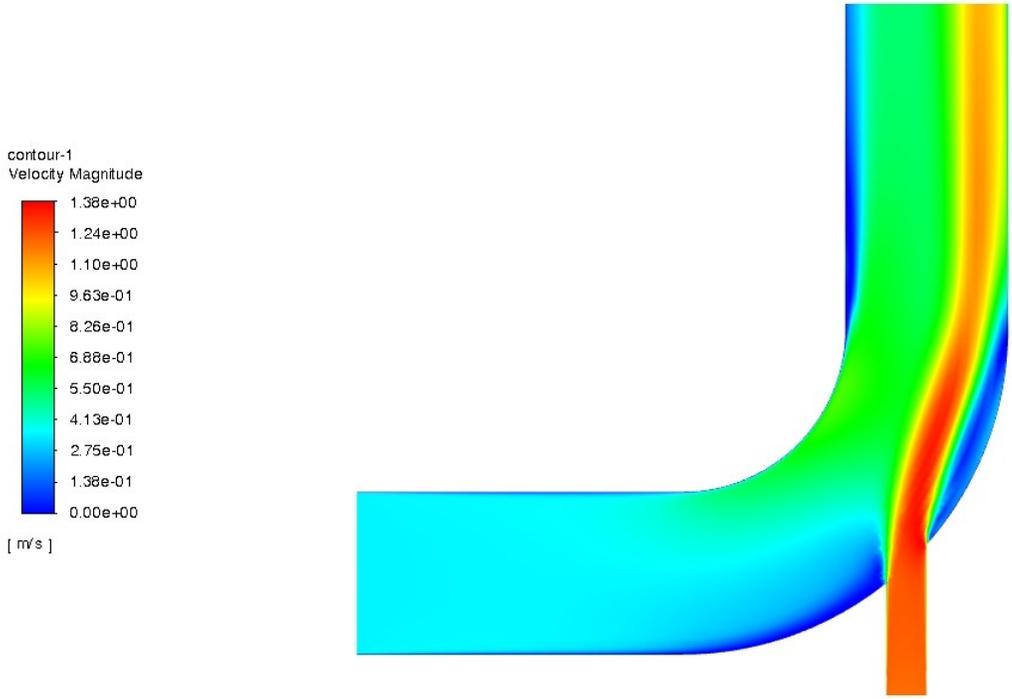
Note: all dimensions are in millimeters

- Working fluid: liquid water.
- Density: 998.2 kg/m³ (constant).
- Viscosity: 0.001003 kg/m-s (constant).
- Thermal conductivity: 0.6 W/m-K (constant).
- Specific heat c_p : 4182 J/kg-K (constant).
- Reference pressure: 101325 Pa.
- Inlet 1:
 - $U_x = 0.4$ m/s.
 - $T = 20$ C.
 - The turbulence quantities values are up to you.
- Inlet 2:
 - $U_y = 1.2$ m/s.
 - $T = 40$ C.
 - The turbulence quantities values are up to you.
- Run the case in laminar and turbulent regimes.
- Before running the simulation scale the domain by 0.1 in all directions.

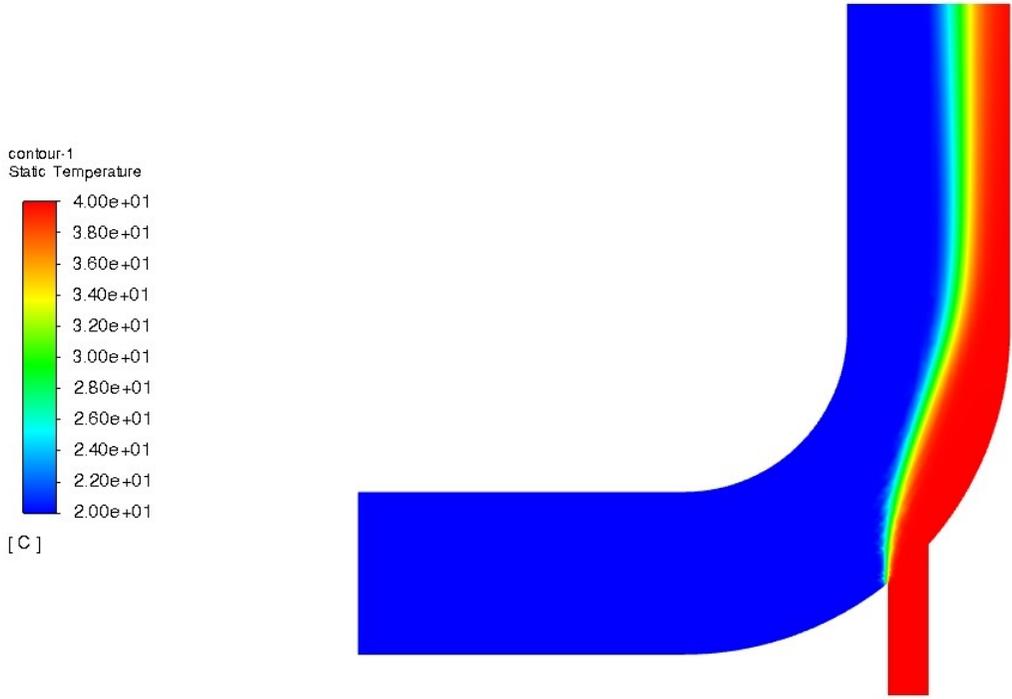
Domain mesh – 2D mesh or surface mesh



Qualitative results – Contour plots

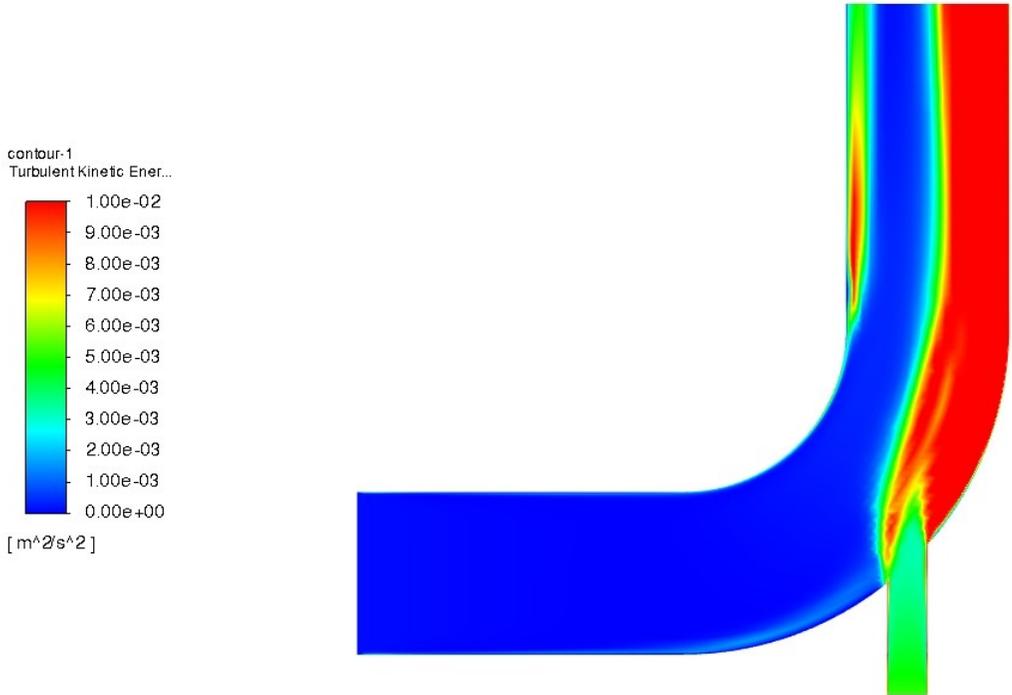


Velocity contours



Temperature contours

Qualitative results – Contour plots

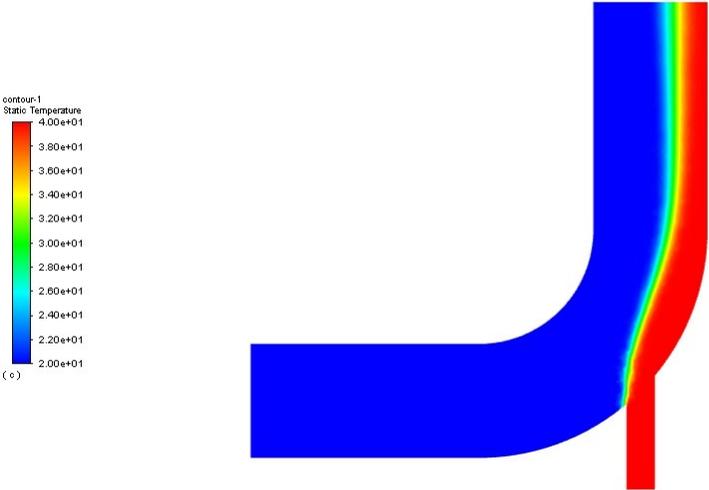


Turbulent kinetic energy contours

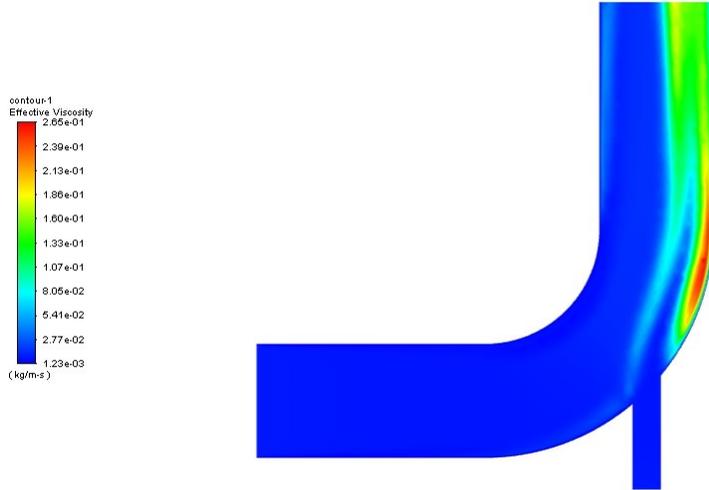


Turbulent viscosity contours

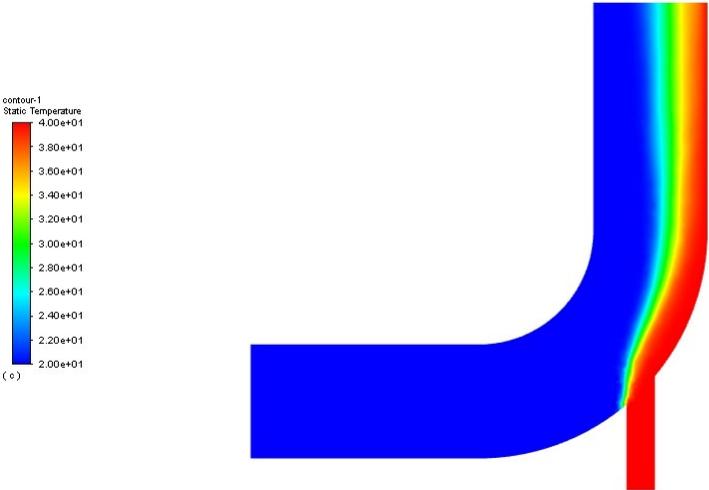
Qualitative results – Contour plots



Temperature contours – 2nd order accuracy (momentum equations)



Effective viscosity – 2nd order accuracy (momentum equations)

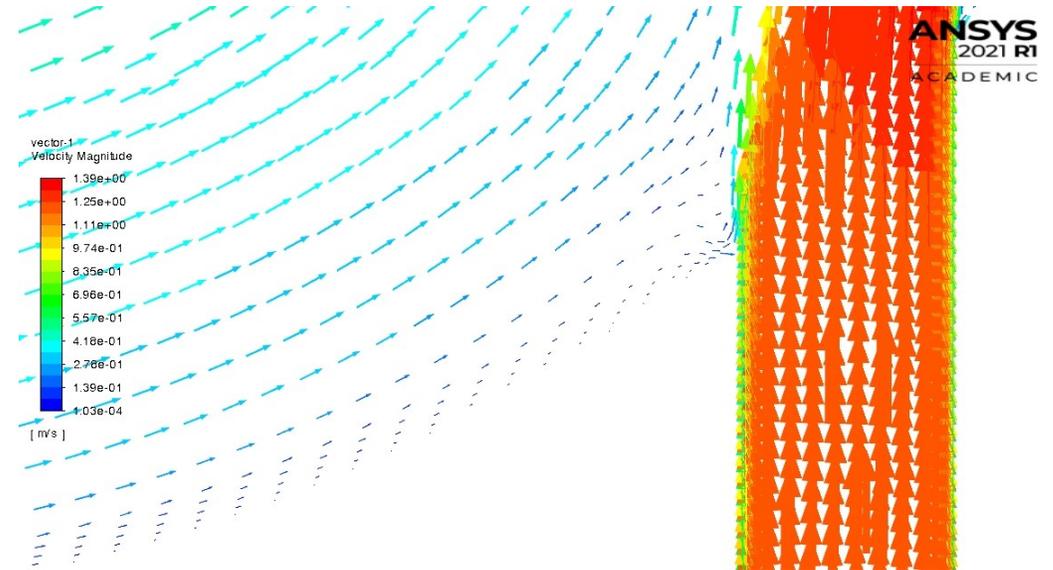
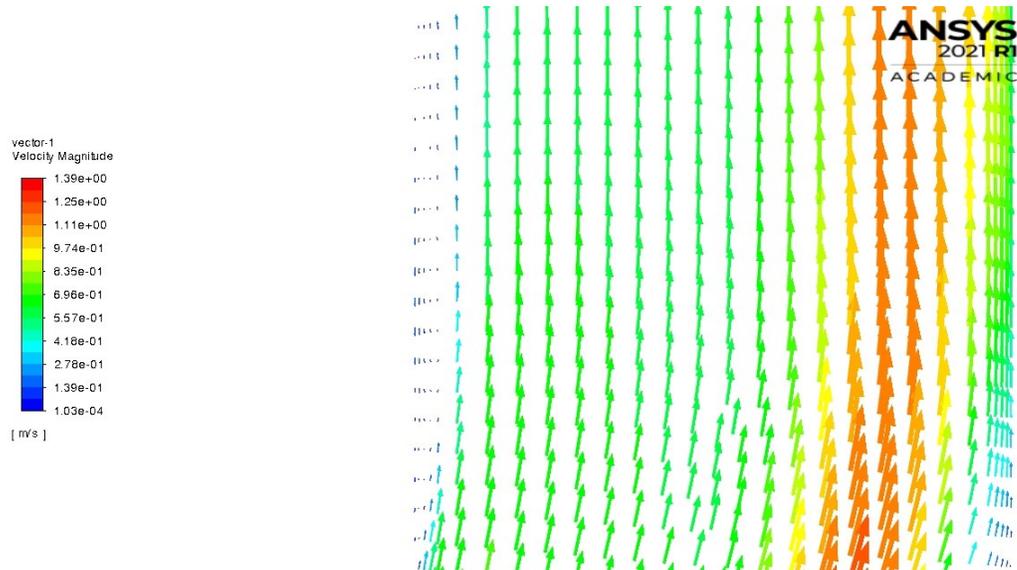
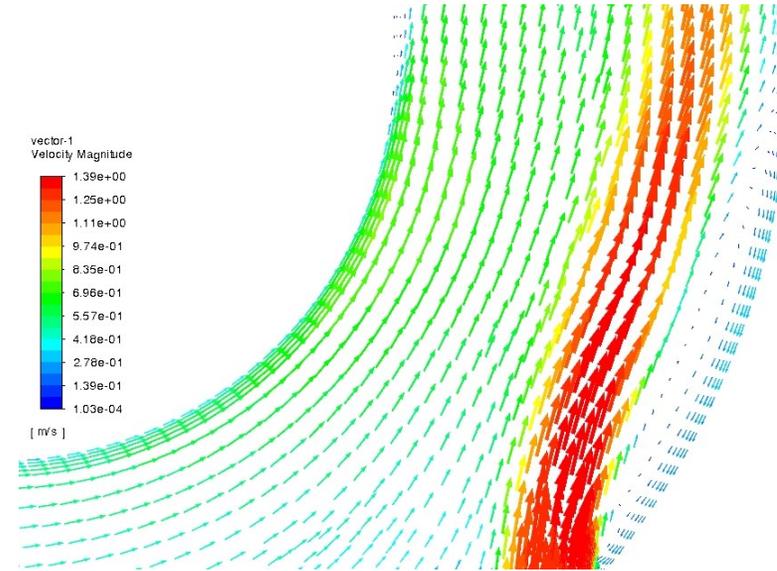
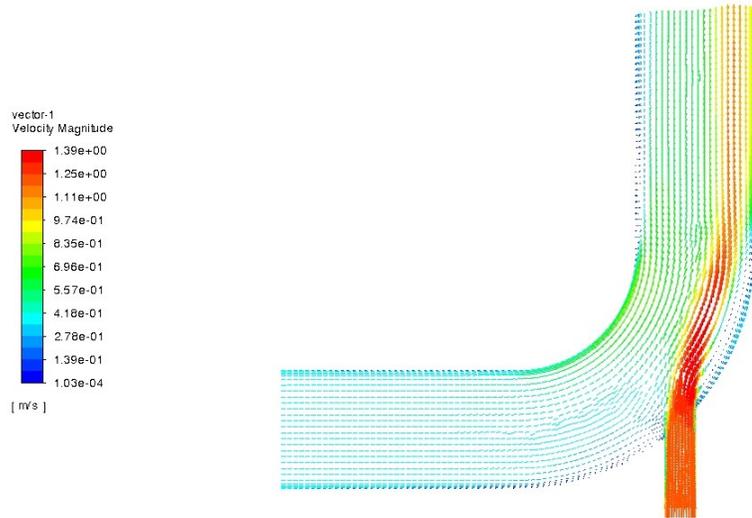


Temperature contours – 1st order accuracy (momentum equations)

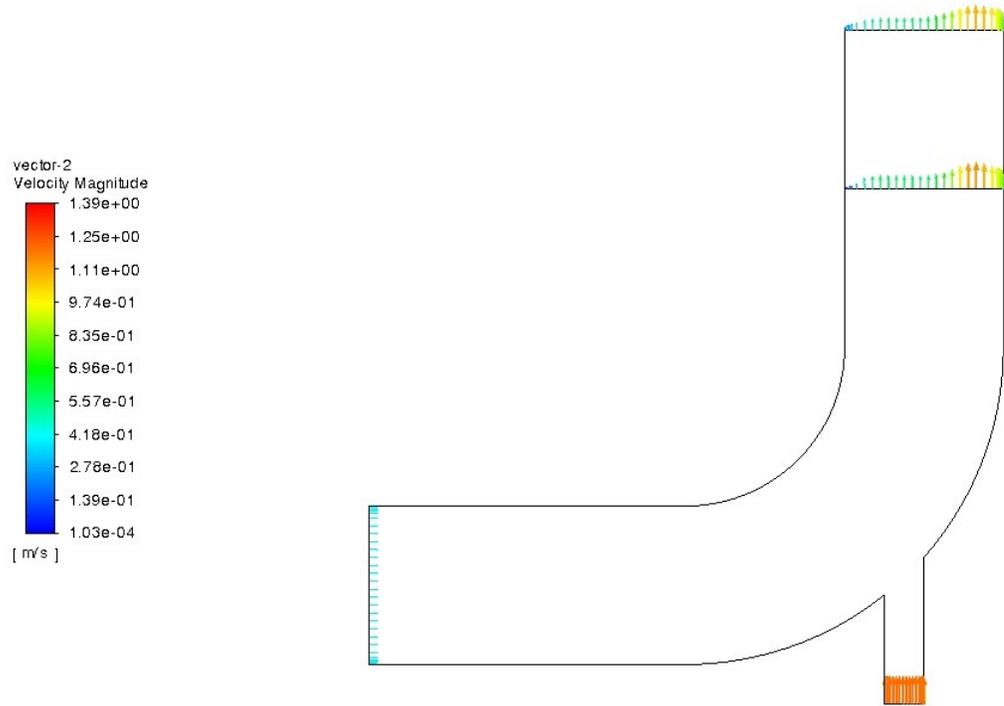


Effective viscosity – 1st order accuracy (momentum equations)

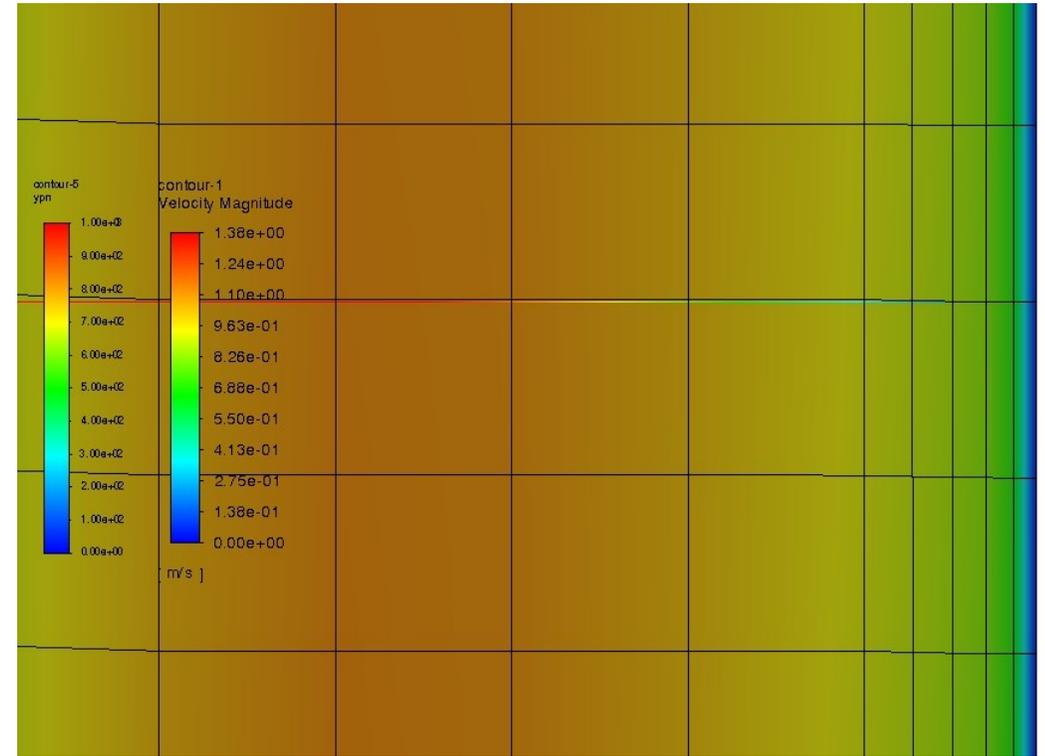
Qualitative results – Vector plots



Qualitative results – Contour and vector plots

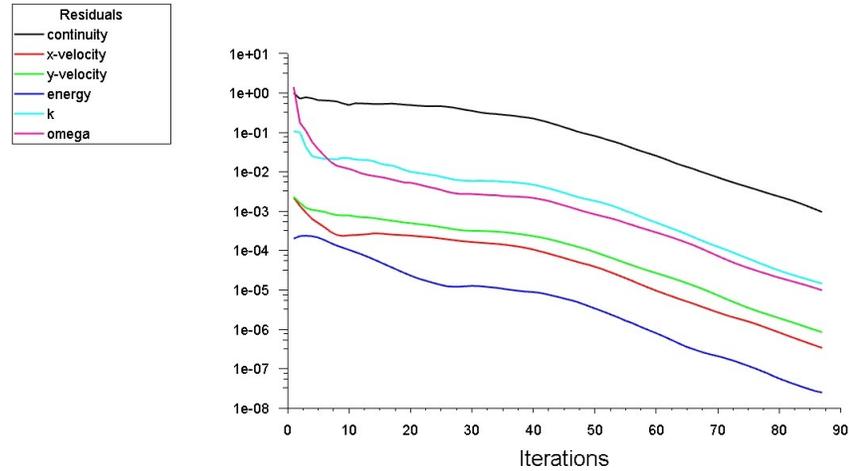


Velocity vectors at sampling line and inlets and outlets

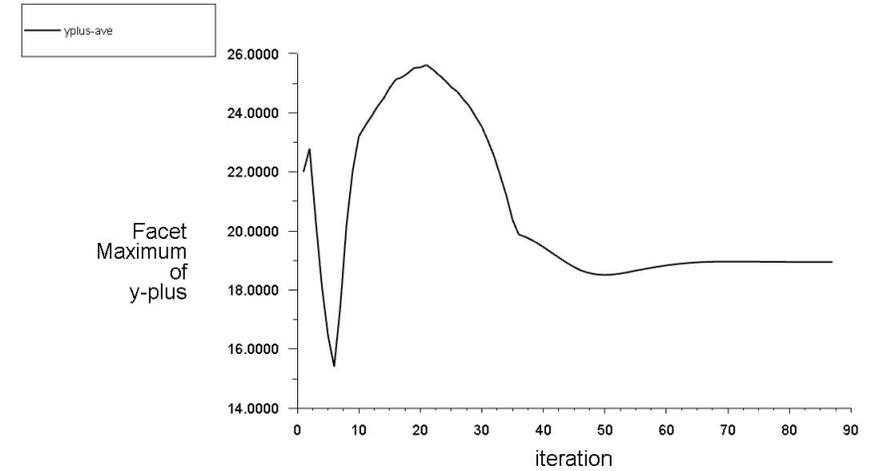


Velocity contours – Contours of y^+ along sampling line

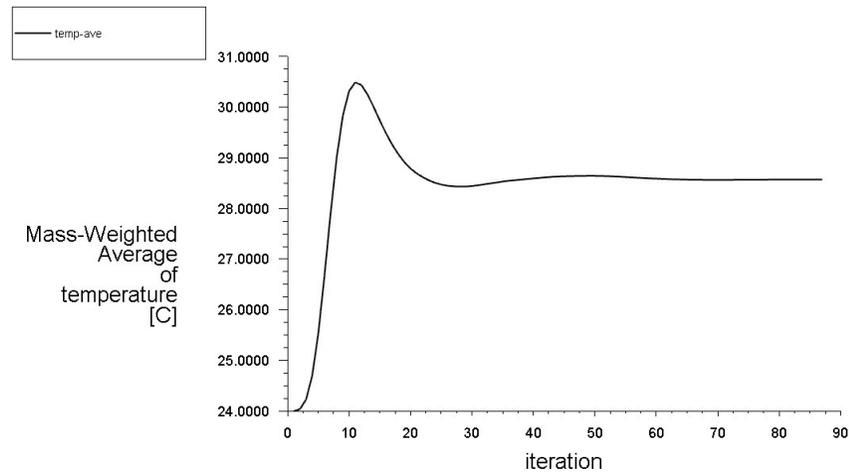
Quantitative results – Residuals and monitored quantities



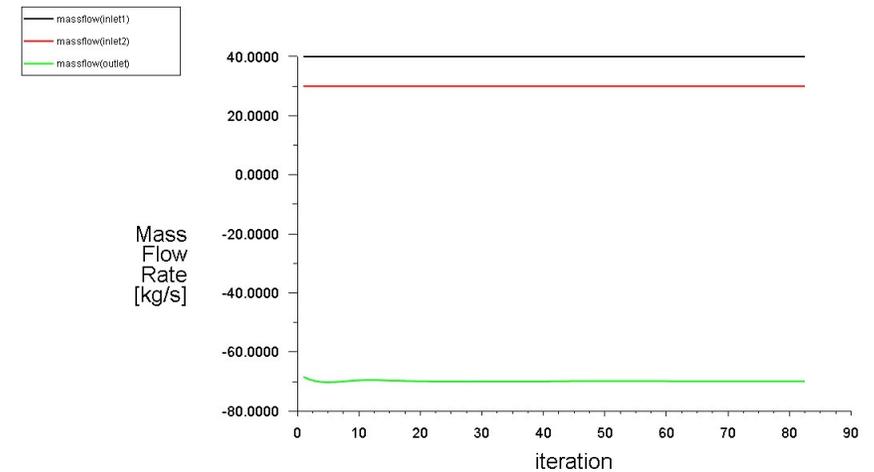
Solution residuals



Maximum y^+ values at the walls

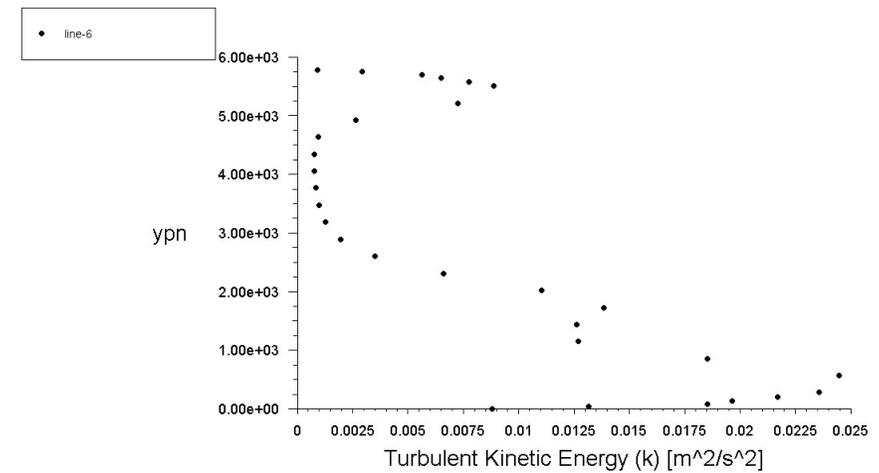
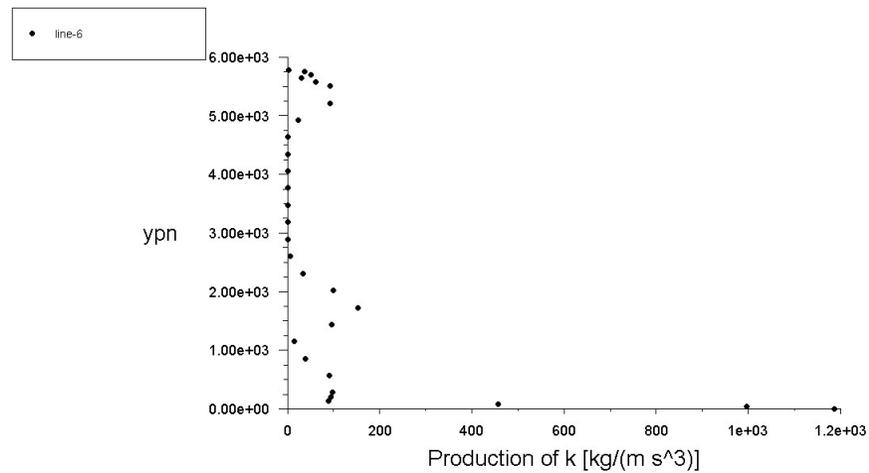
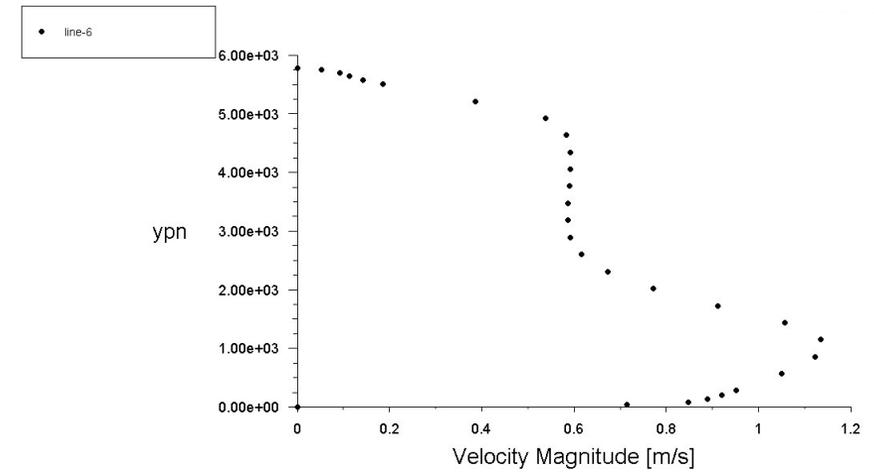
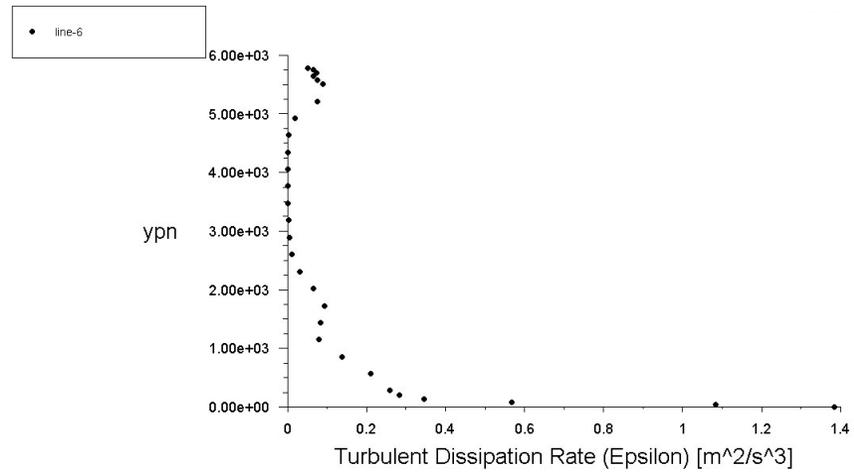


Mass-weighted temperature at the outlet

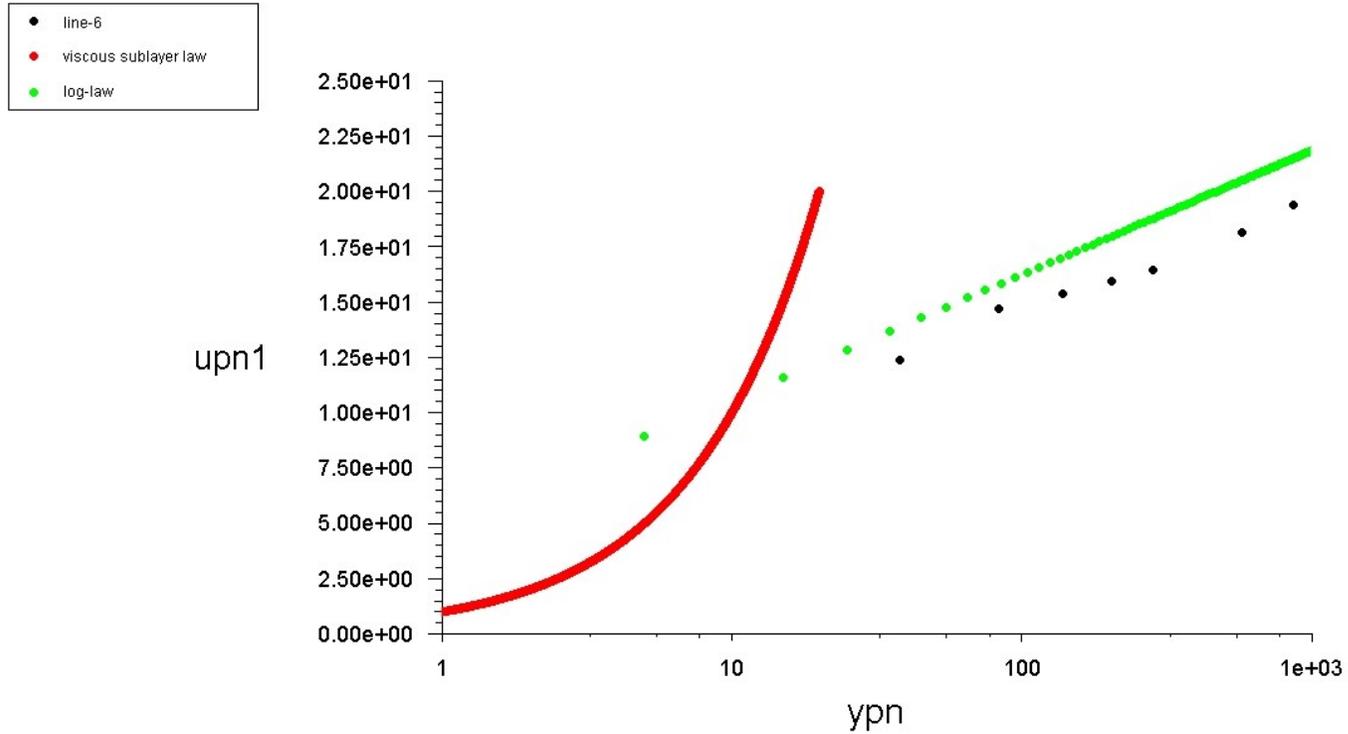


Mass flow at each boundary – Negative values indicate flow going out

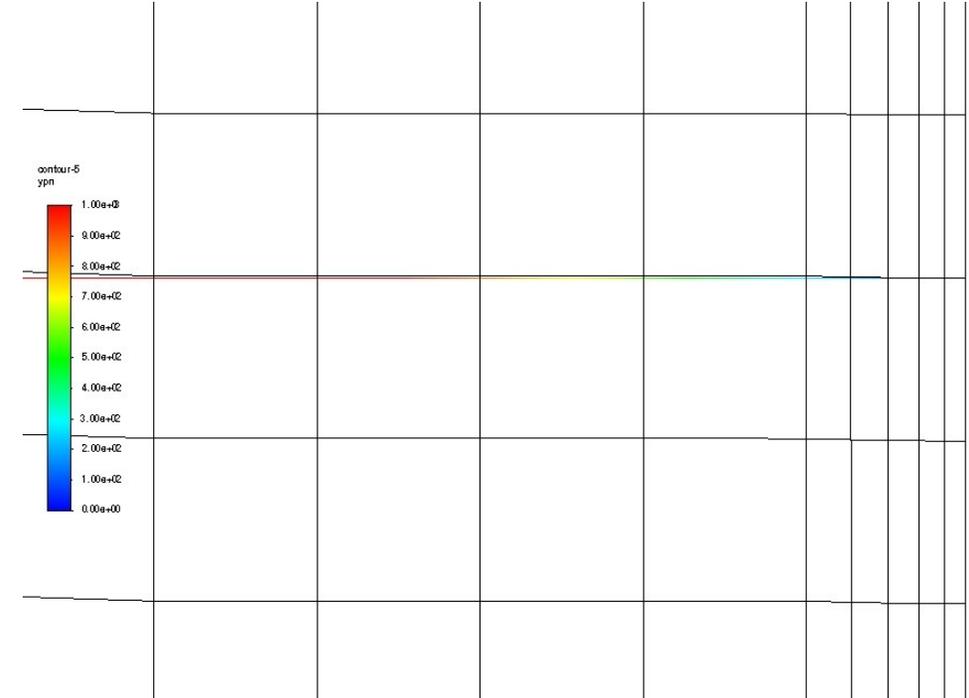
Quantitative results – Turbulent quantities along sampling line



Quantitative results – u^+ vs. y^+ plot



u^+ vs y^+ plot at sampling line



Contours y^+ value along sampling line