STRUCTURE OF THE INPUT FILE

GLOBAL PROBLEM

Files	Topology	Level Set	Time Dependence	Convergence
Axis	Frames Of Reference	Probe Set	Stat Parameters	Restart

DGFluid PROBLEM

Physics

- Properties
- Boundary Conditions
- Initial Conditions
- Nondimensionalisation
- Source Term

Numerics

- Spatial Discretisation
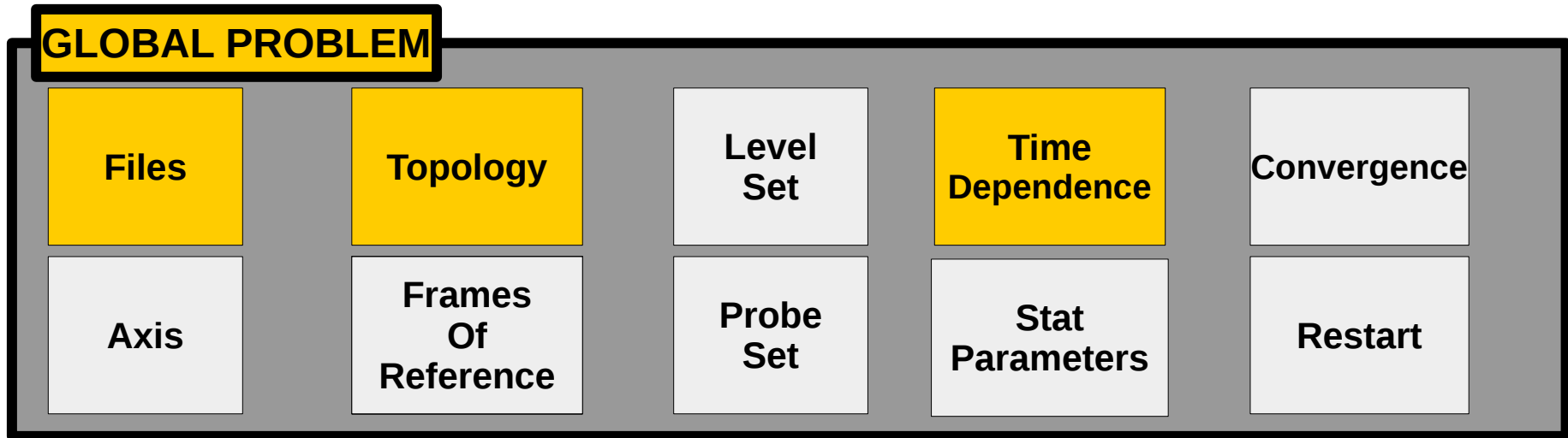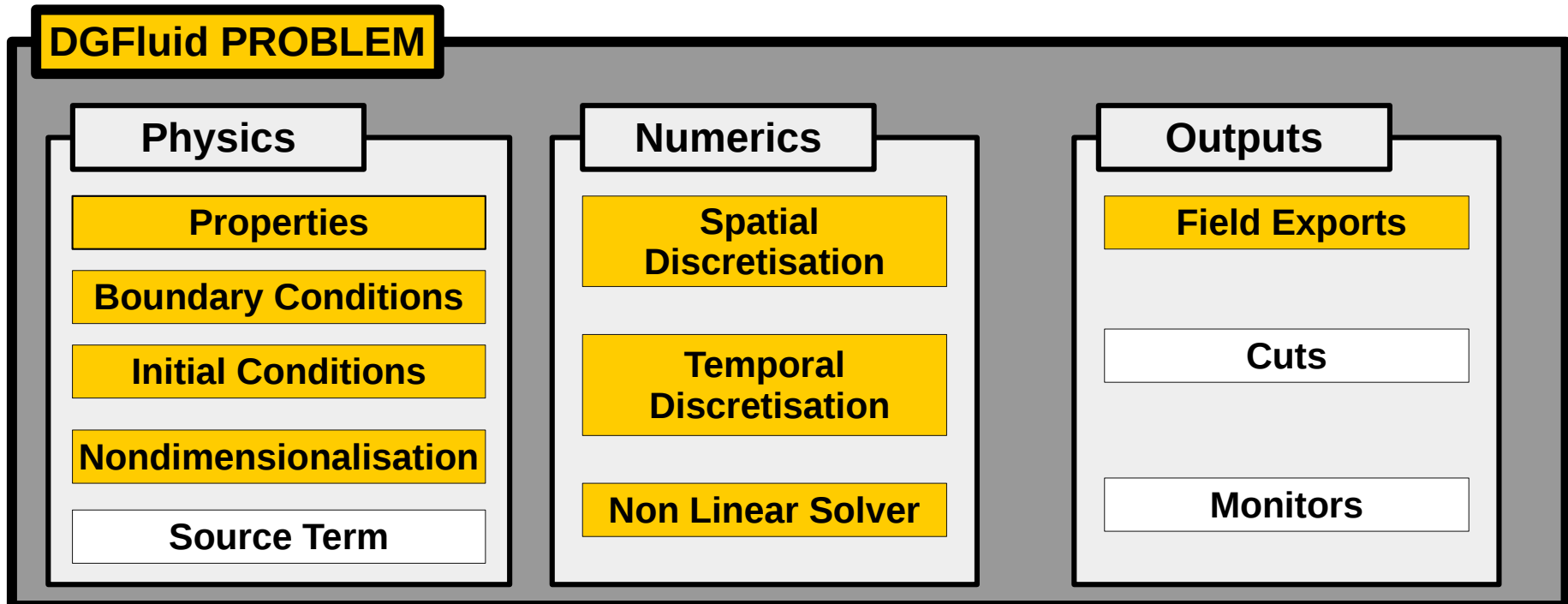- Temporal Discretisation
- Non Linear Solver

Outputs

- Field Exports
- Cuts
- Monitors
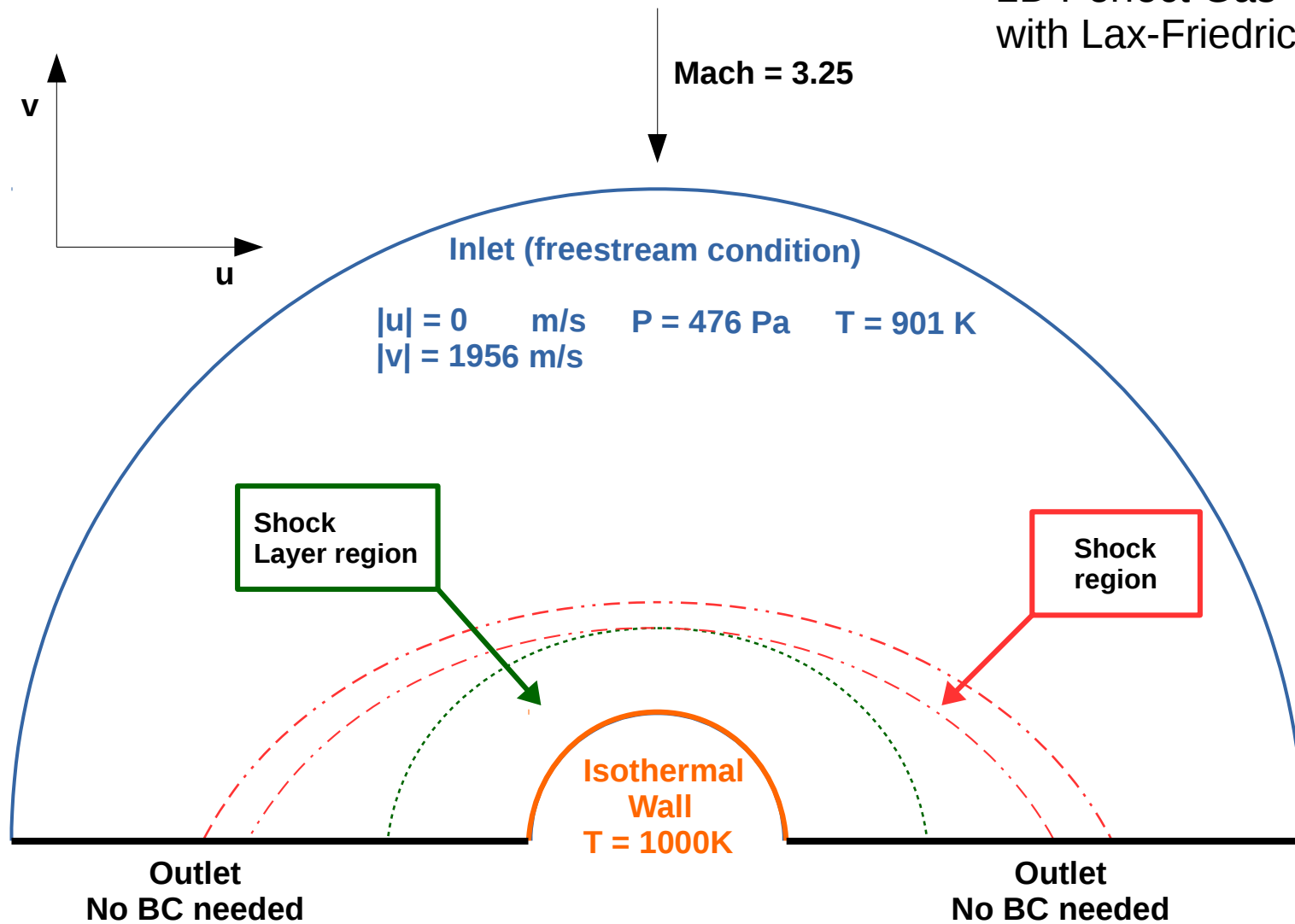
STRUCTURE OF THE INPUT FILE for our case

GLOBAL PROBLEM

Files	Topology	Level Set	Time Dependence	Convergence
Axis	Frames Of Reference	Probe Set	Stat Parameters	Restart

DGFluid PROBLEM

Physics

- Properties
- Boundary Conditions
- Initial Conditions
- Nondimensionalisation
- Source Term

Numerics

- Spatial Discretisation
- Temporal Discretisation
- Non Linear Solver

Outputs

- Field Exports
- Cuts
- Monitors

2D Perfect Gas
with Lax-Friedrichs flux

Mach = 3.25

v

u

Inlet (freestream condition)

|u| = 0   m/s   P = 476 Pa   T = 901 K
|v| = 1956 m/s

Shock
Layer region

Shock
region

Isothermal
Wall
T = 1000K

Outlet
No BC needed

Outlet
No BC needed

Unrefined Meshes

Coarse structured mesh
3323 elements

0.5

2

2880
2680
2480
2290
2090
1890
1690
1490
1300
1100
901

[K]
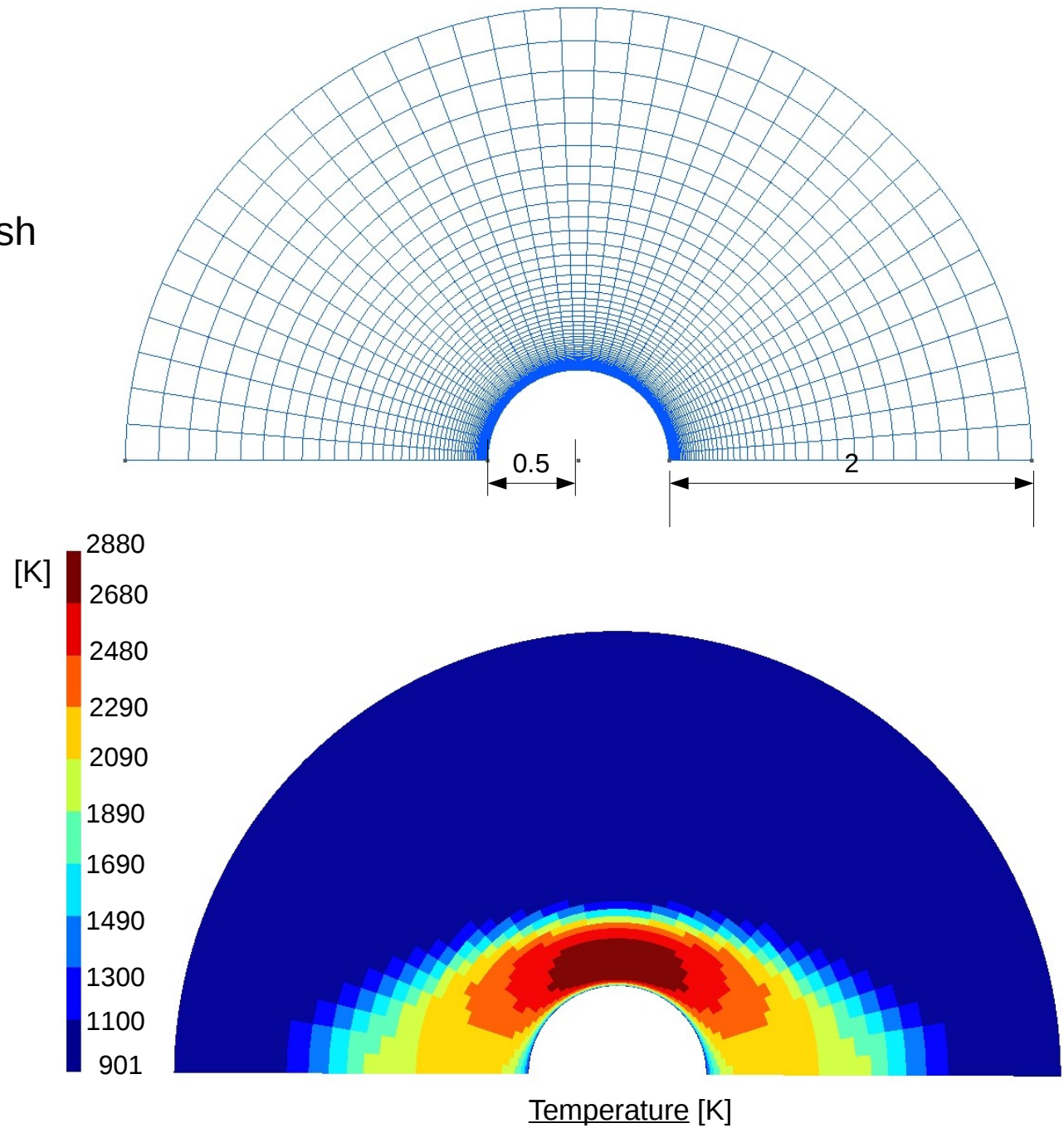
Temperature [K]
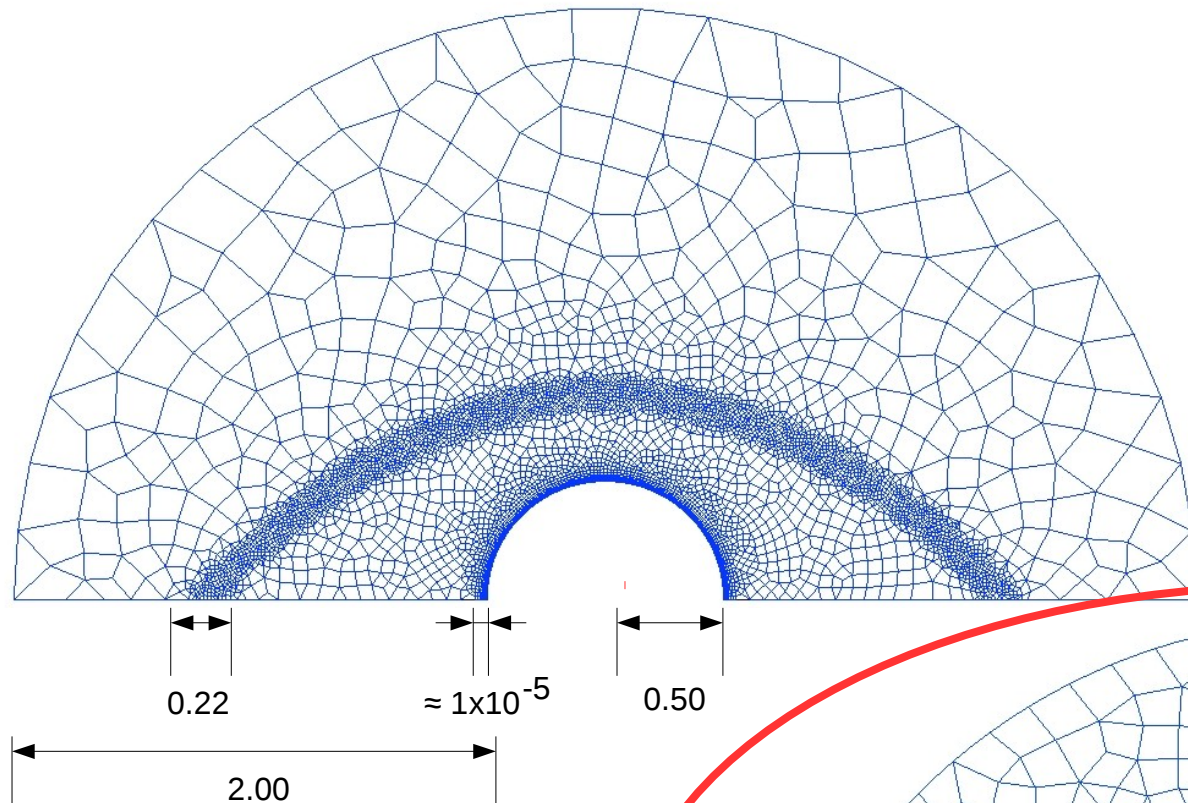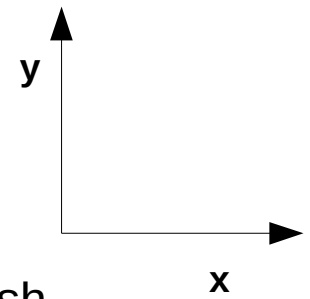
Refined Meshes

Unstructured mesh
7424 elements
  -1154 triangles
  - 5764 quadrangles

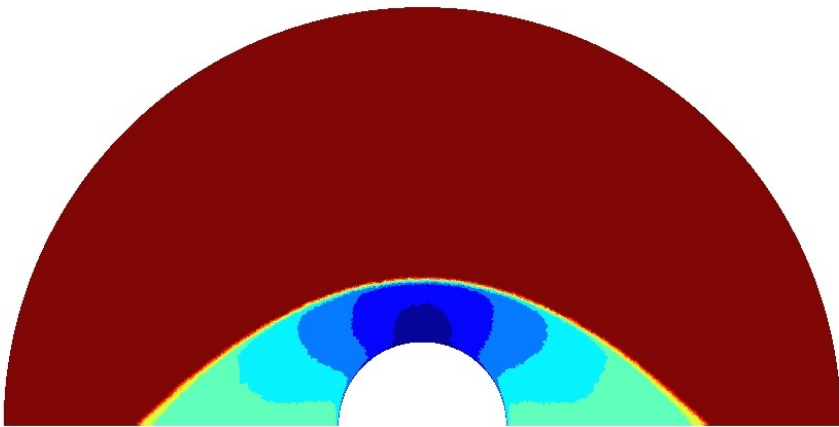0.22   ≈ 1x10^{-5} 0.50

2.00

Unstructured mesh
15 606 elements
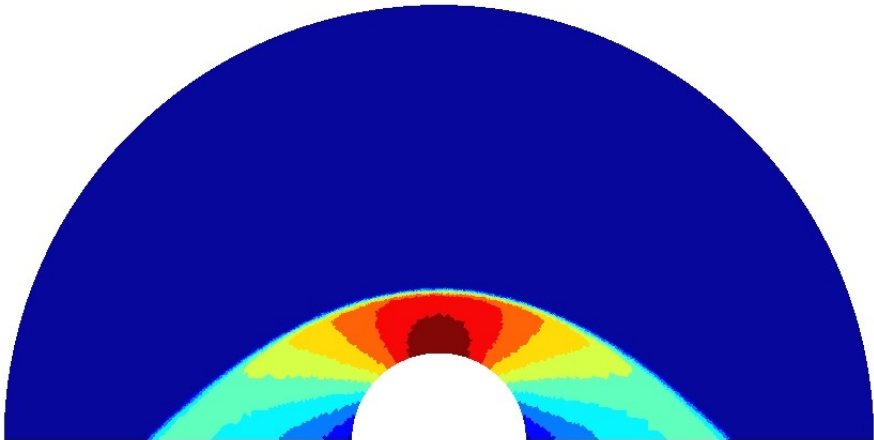 - 2865 triangles
  - 11652 quadrangles

0.40
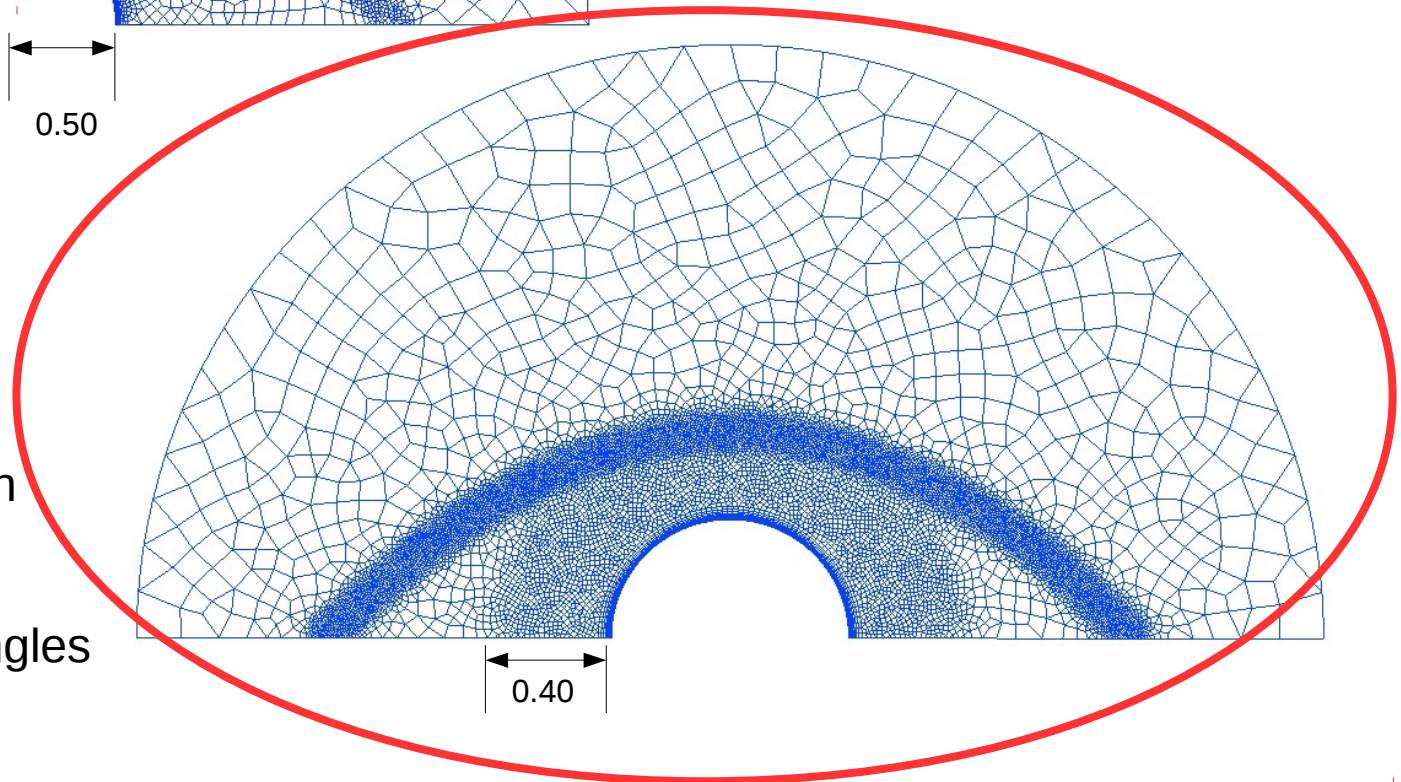
Solution on Refined 15606 elements mesh P0

Temperature [K]

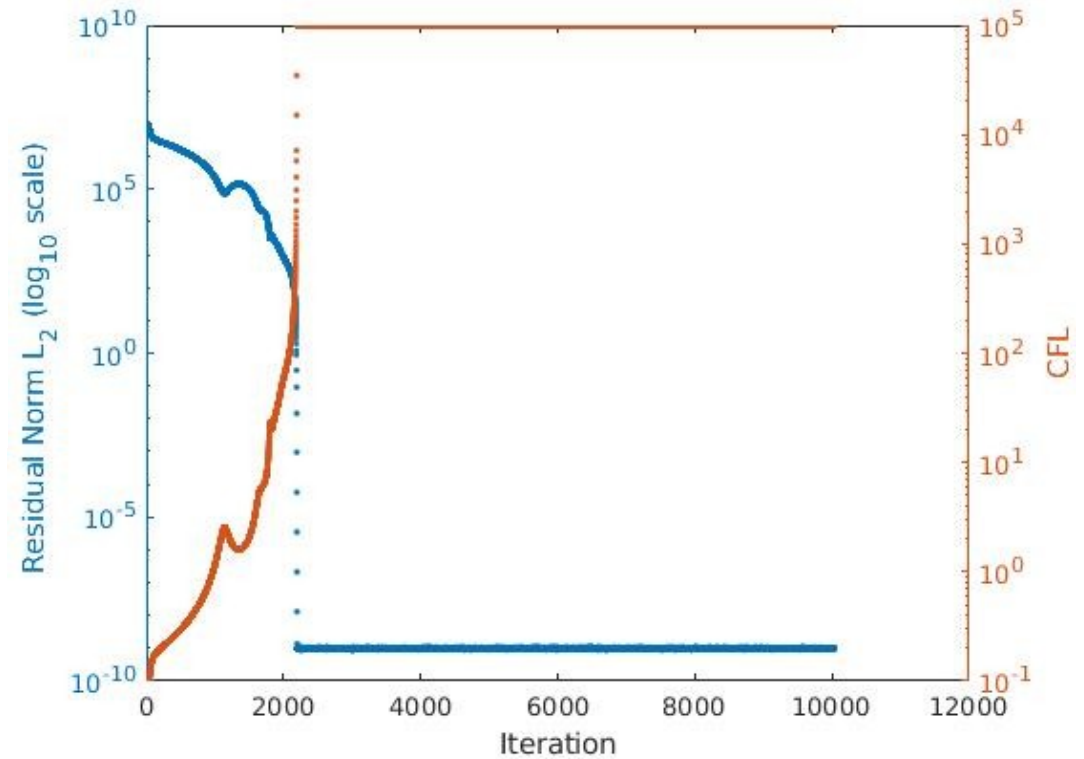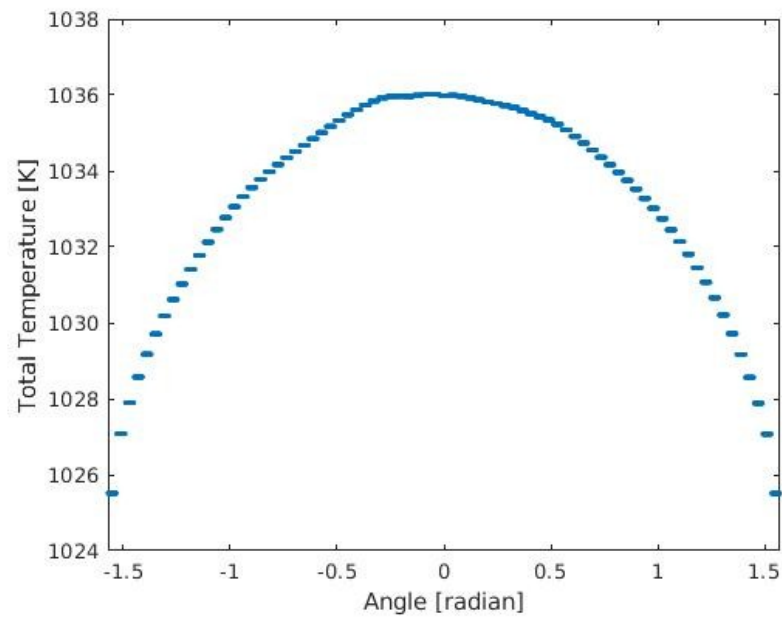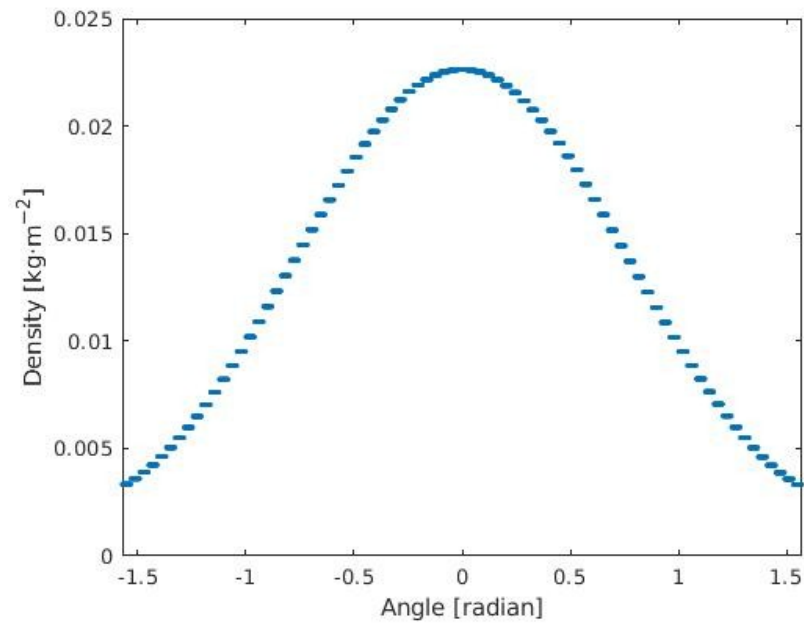901   1830   2770
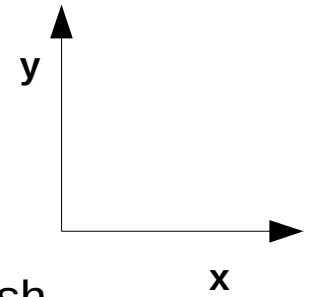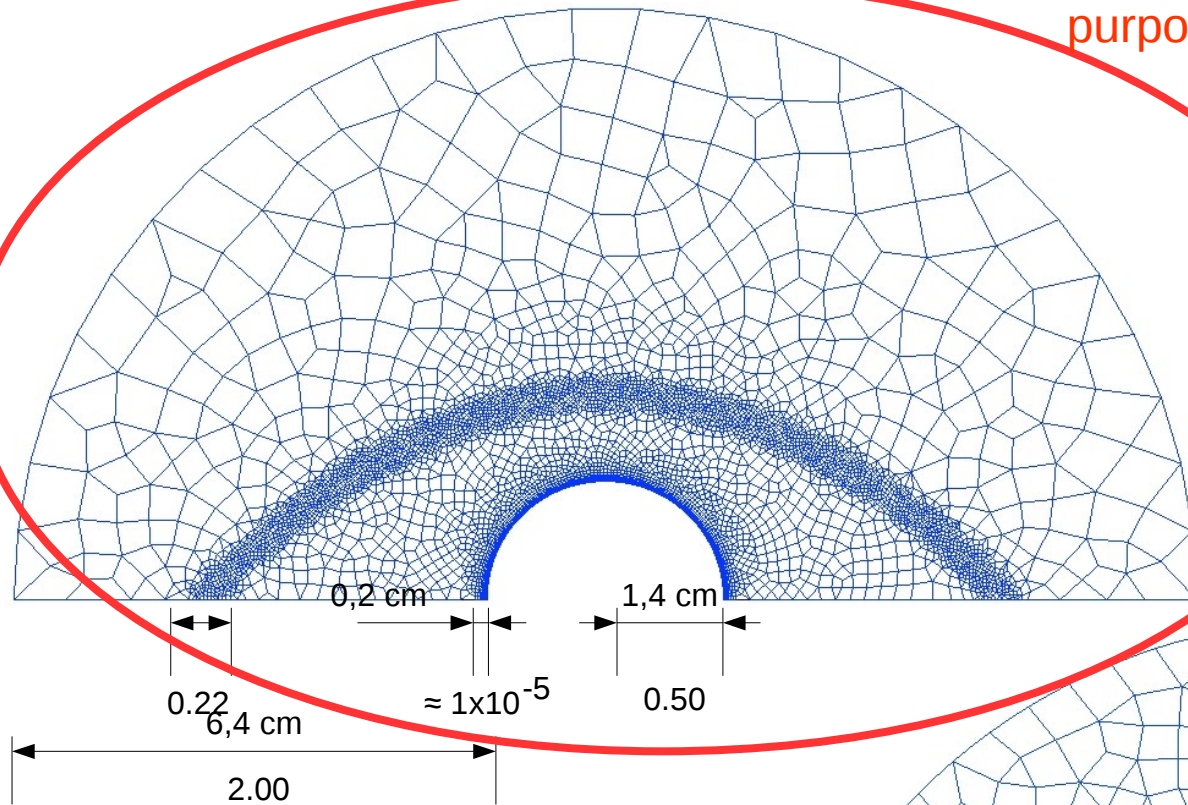
Mach Number

0   1.63   3.25

Pressure [Pa]

476   3600   6730
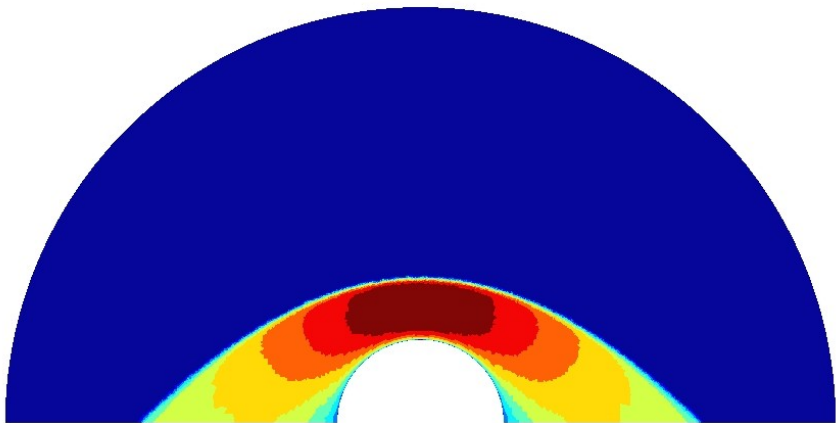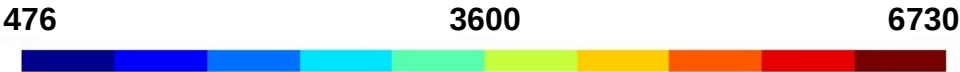
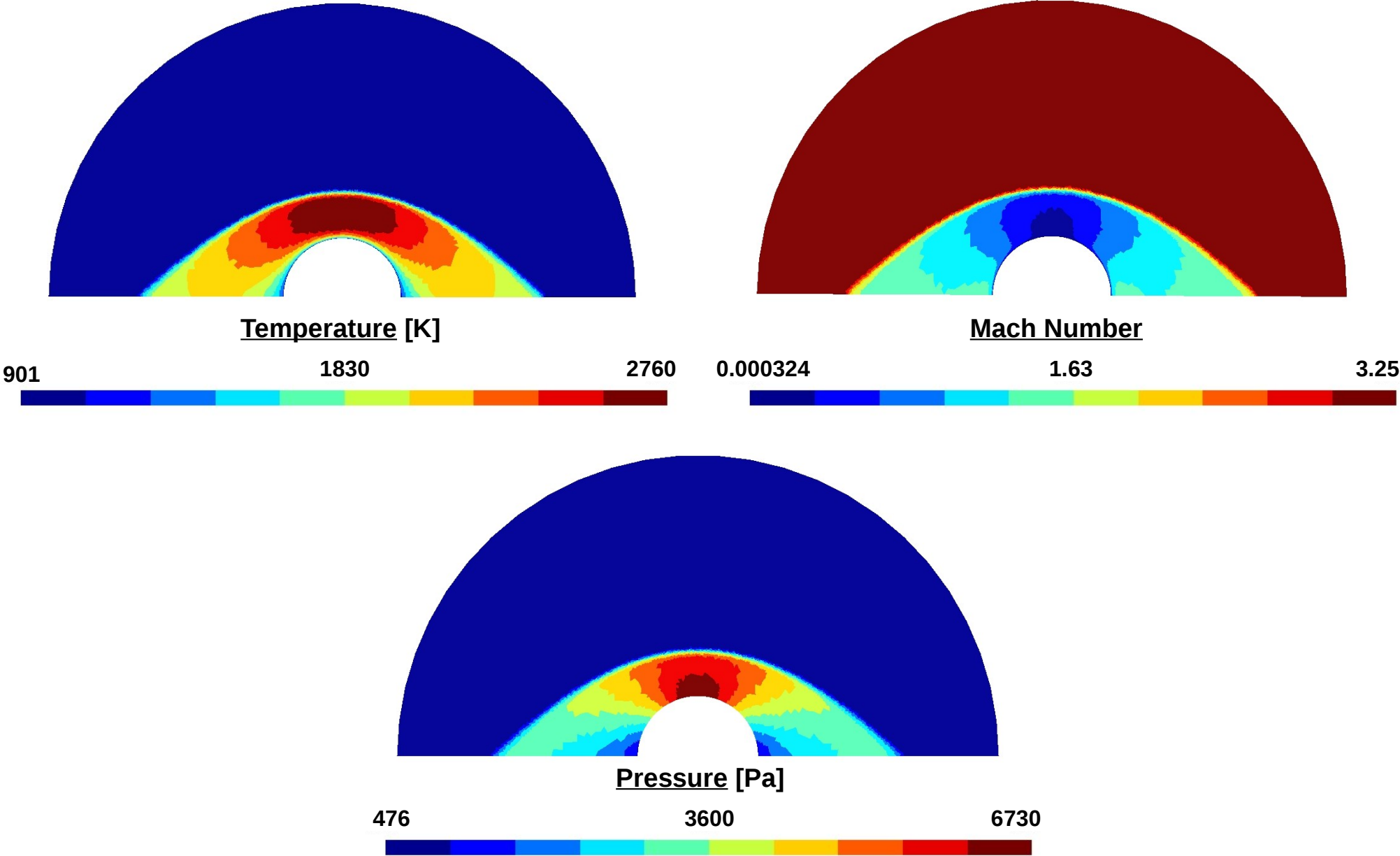# Solution along the wall on Refined 15 606 elements mesh P0

Refined Meshes

y

x

Unstructured mesh
7424 elements
  -1154 triangle
  - 5764 quadrangle

0,2 cm

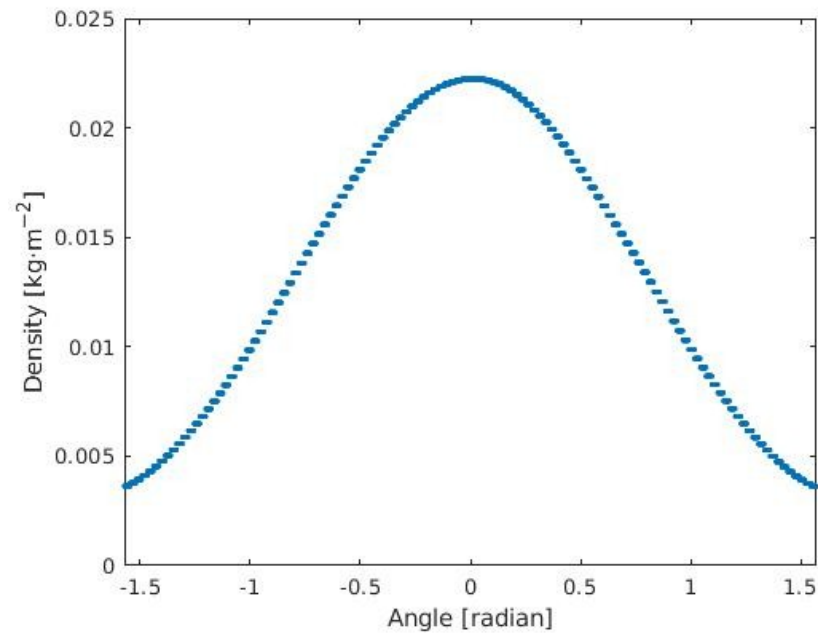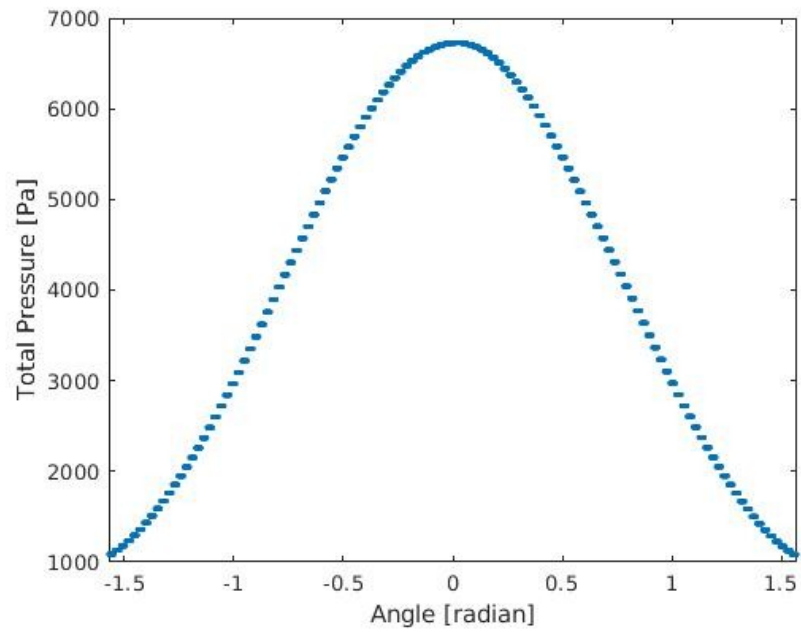1,4 cm

0.22

≈ 1x10^{-5}

0.50

6,4 cm

2.00

Unstructured mesh
15 606 elements
Triangle + quadrilateral

1,6 cm

0.40
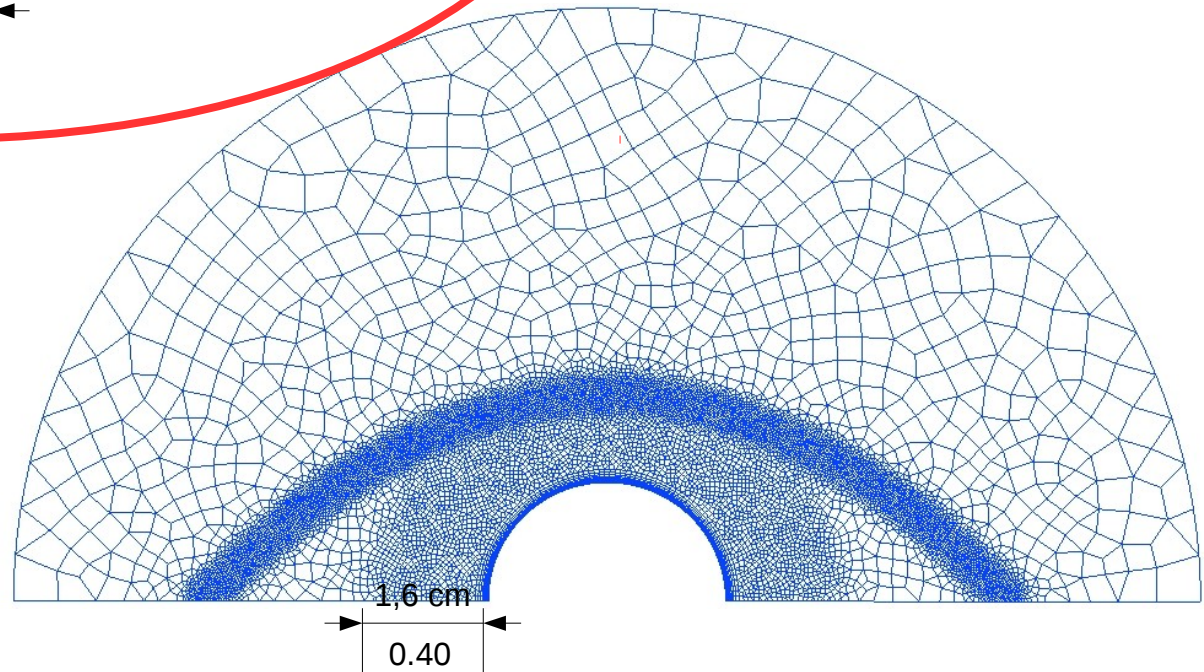
Solution on Refined 7424 element mesh P0

Temperature [K]

901   1830   2760

Mach Number

0.000324   1.63   3.25

Pressure [Pa]

476   3600   6730
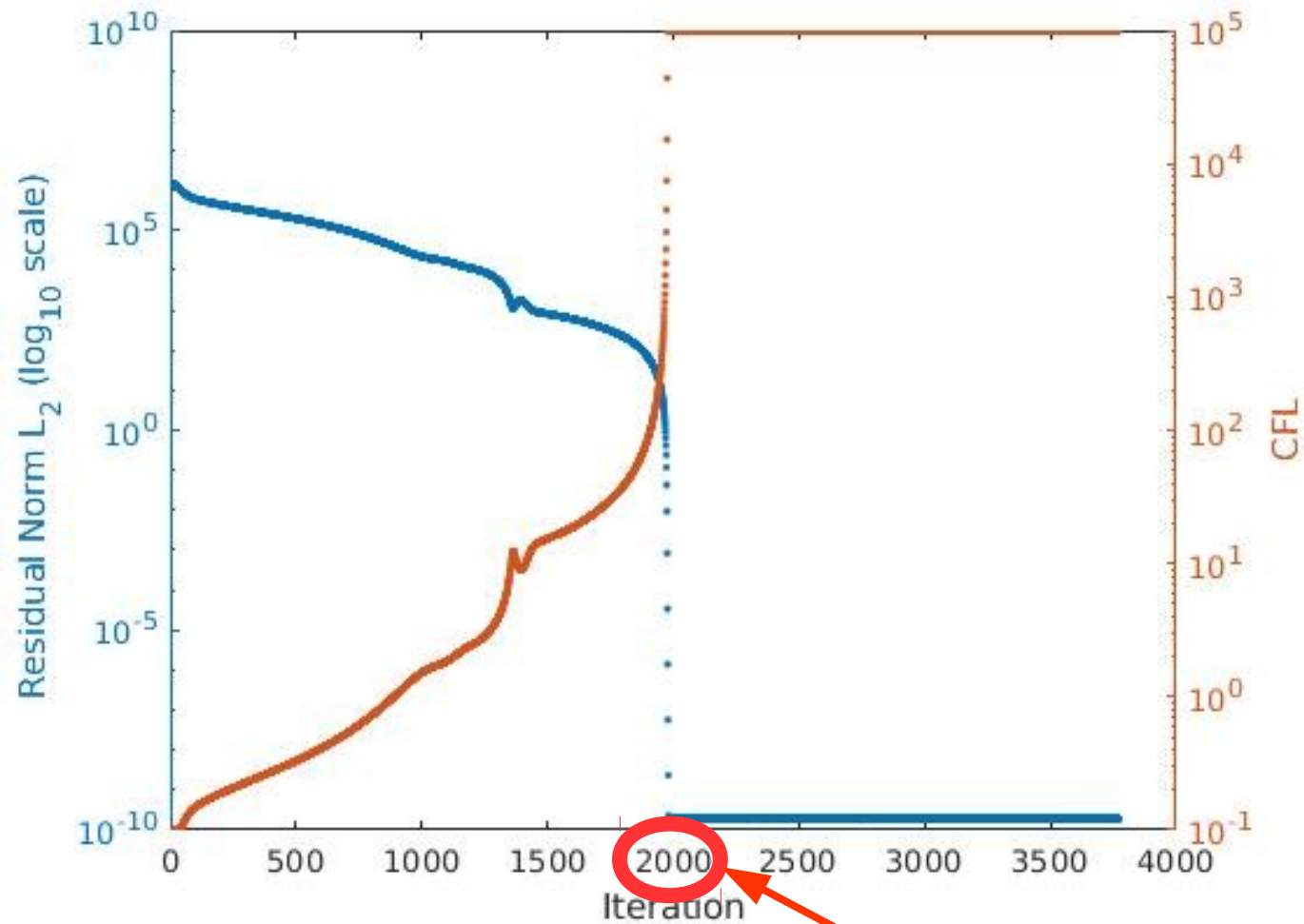
Solution along the wall on Refined 7424 element mesh P0
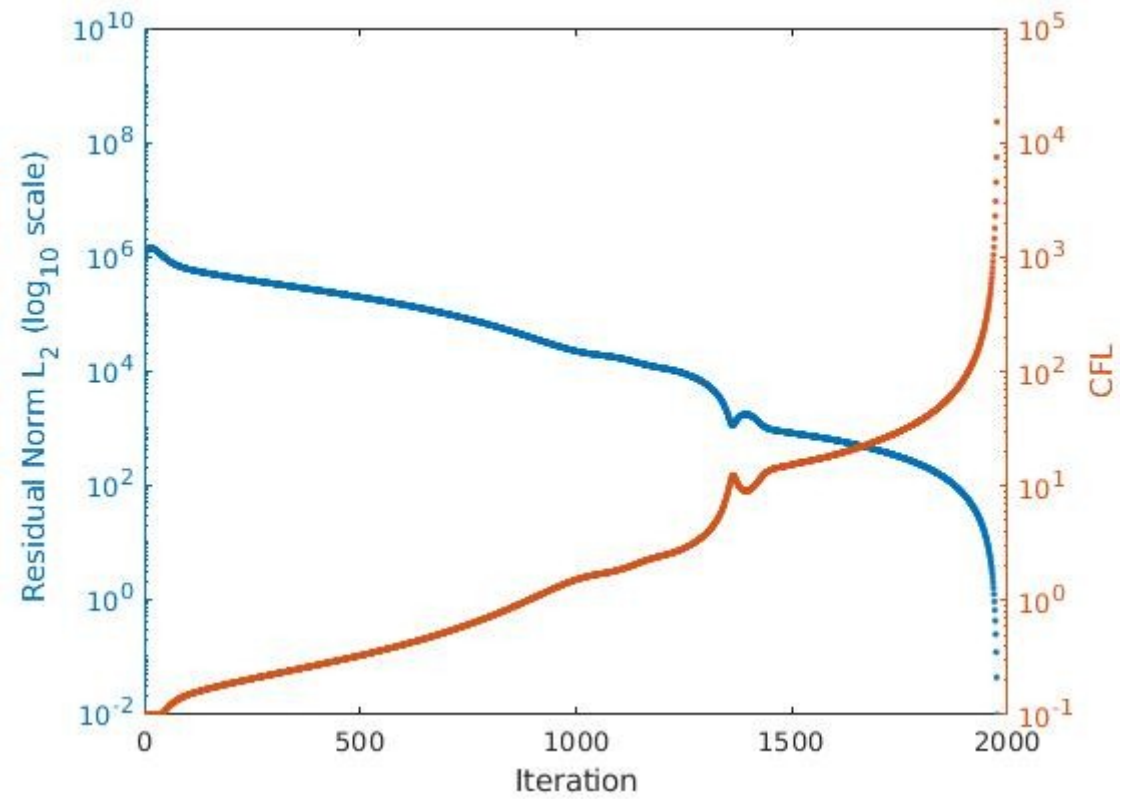
Solution along the wall on Refined 7424 elements mesh P0
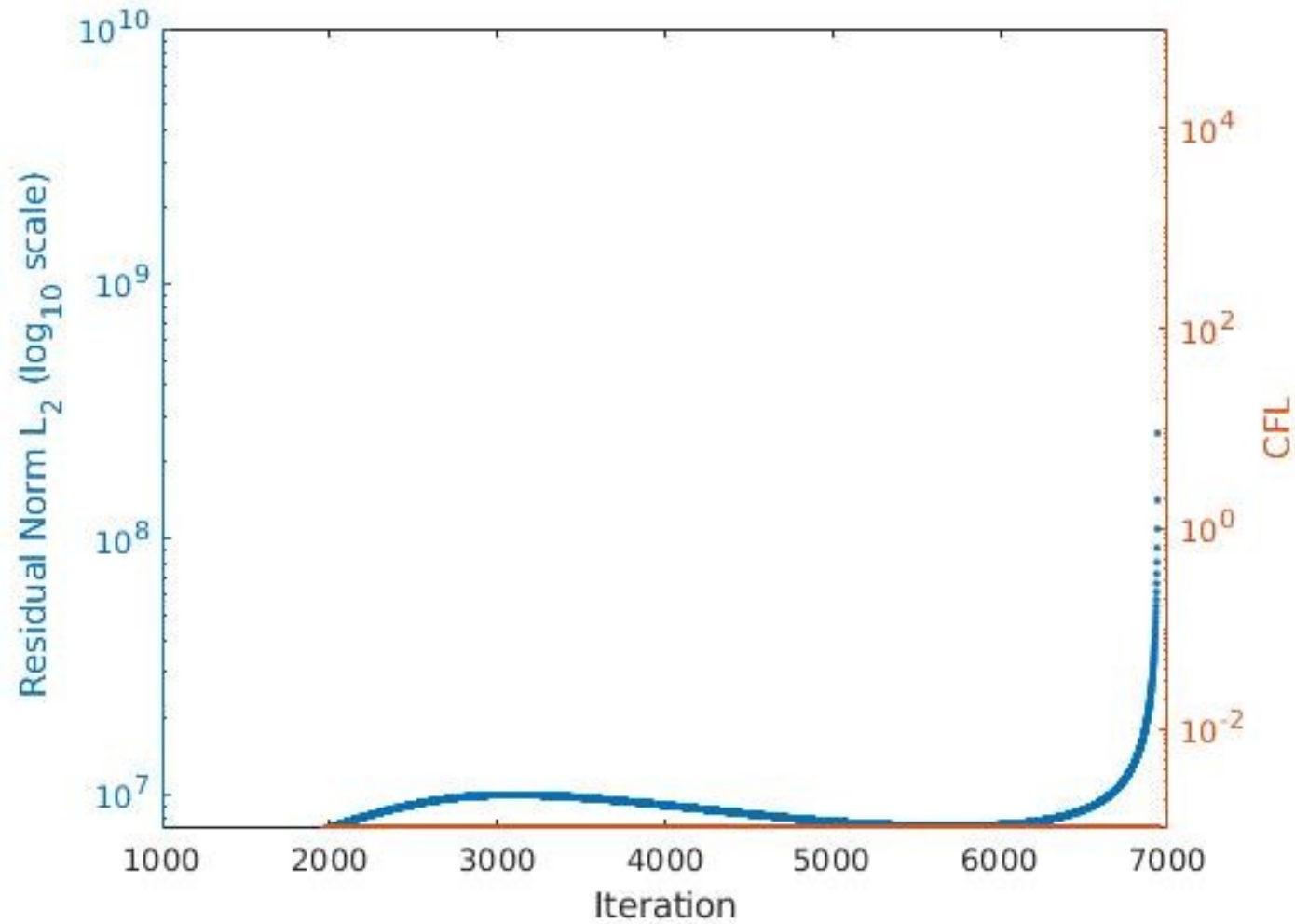try to get more precision... (ie increase the order of the
polynomial to degP=1)
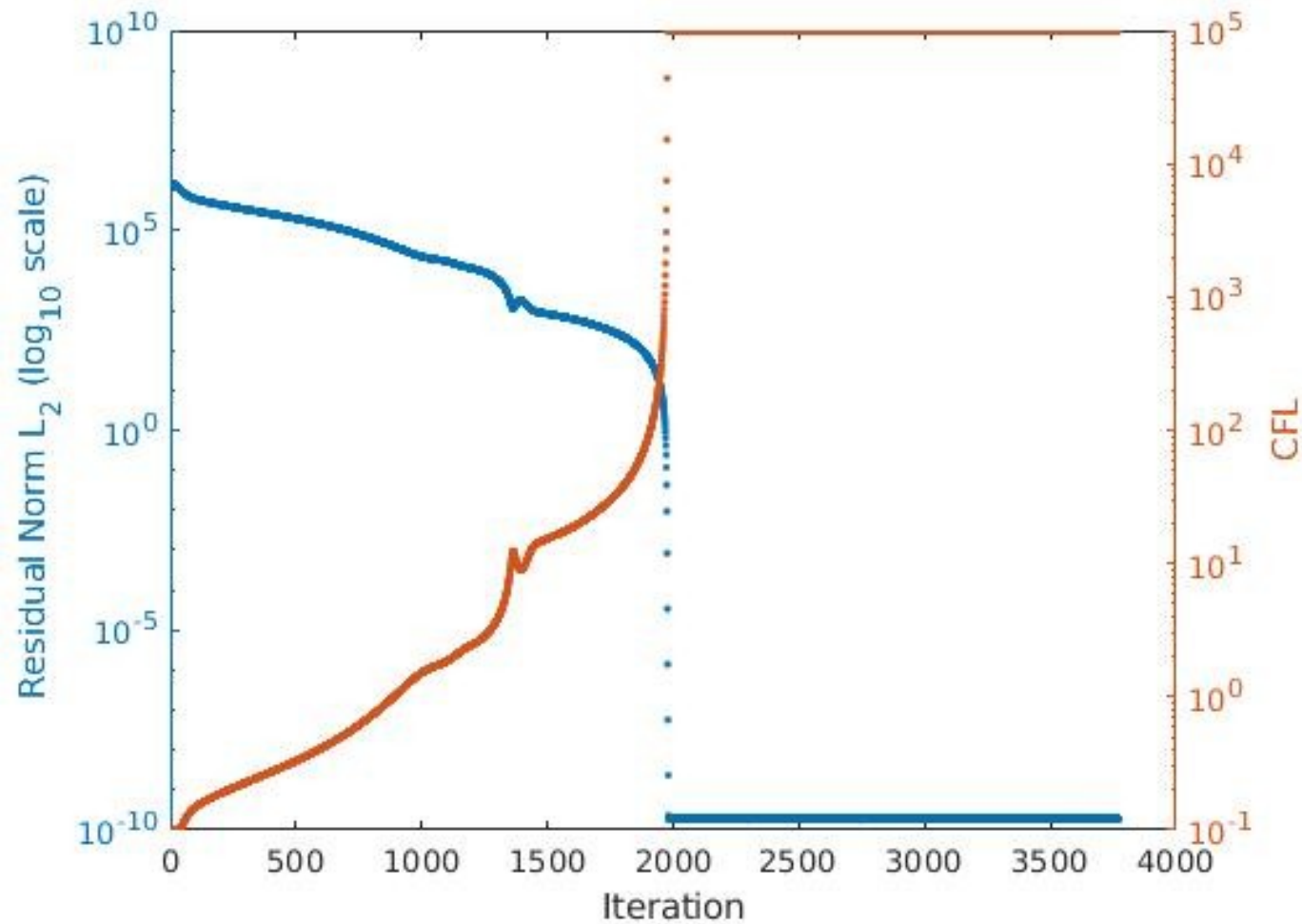
Solution along the wall on Refined 7424 elements mesh P0
try to get more precision… (ie increase the order of the
polynomial to degP=1)

Restart from here in
P1

Solution along the wall on Refined 7424 element mesh **P1**
without Artificial Viscosity

Solution along the wall on Refined 7424 element mesh **P1**
WITH Artificial Viscosity

COMING SOON !