Cockcroft Update

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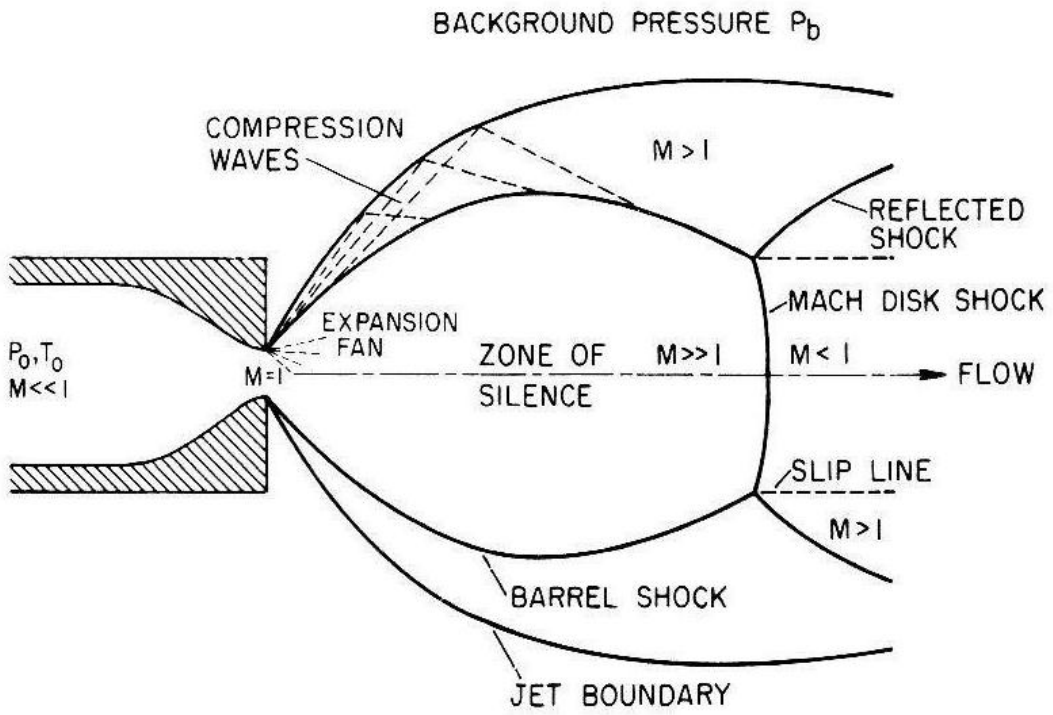
- To better understand the expansion of the gas into the chamber simulations on the continuous flow of the jet from the nozzle towards the first skimmer have been carried out.



$X_d/d = 0.67\sqrt{(p_0/p_a)}$

$P_0 =$ 5E5pa

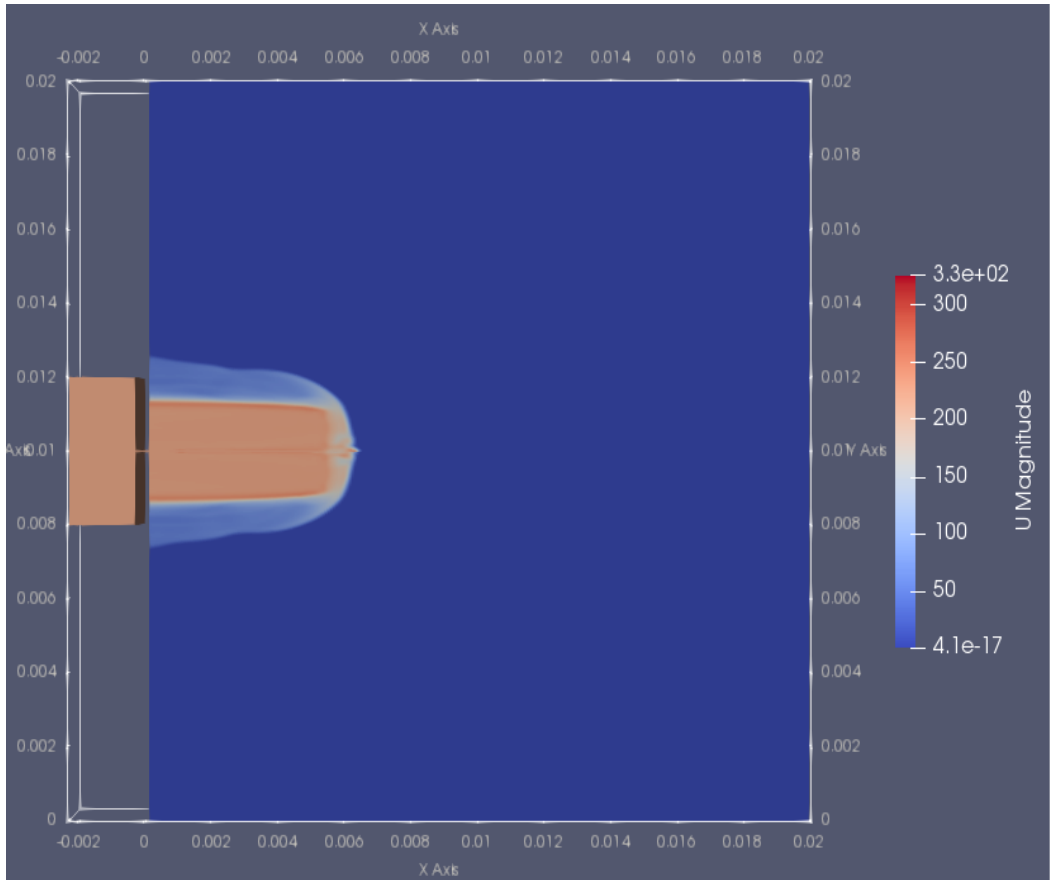
$P_a =$0.1pa

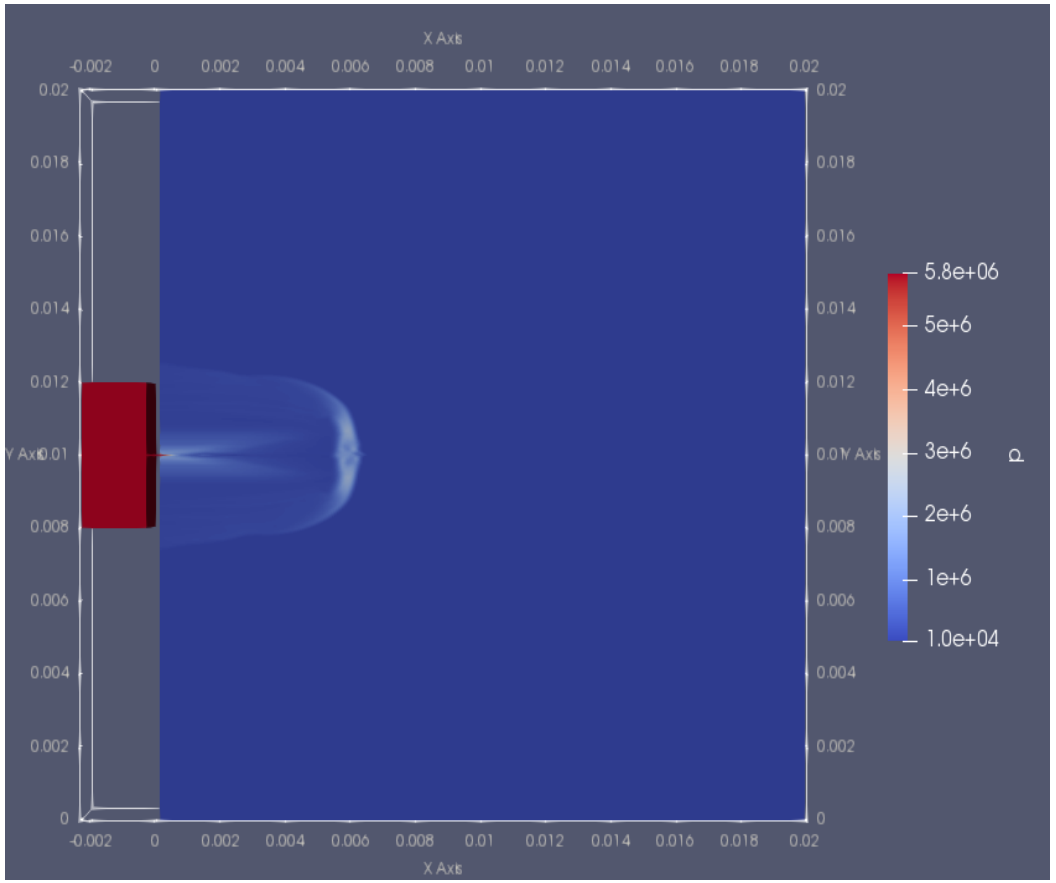
- RhoCentralFoam, a density-based compressible flow solver, was picked as the appropriate solver.

- A series of different geometries with different boundary conditions and time steps were tested.

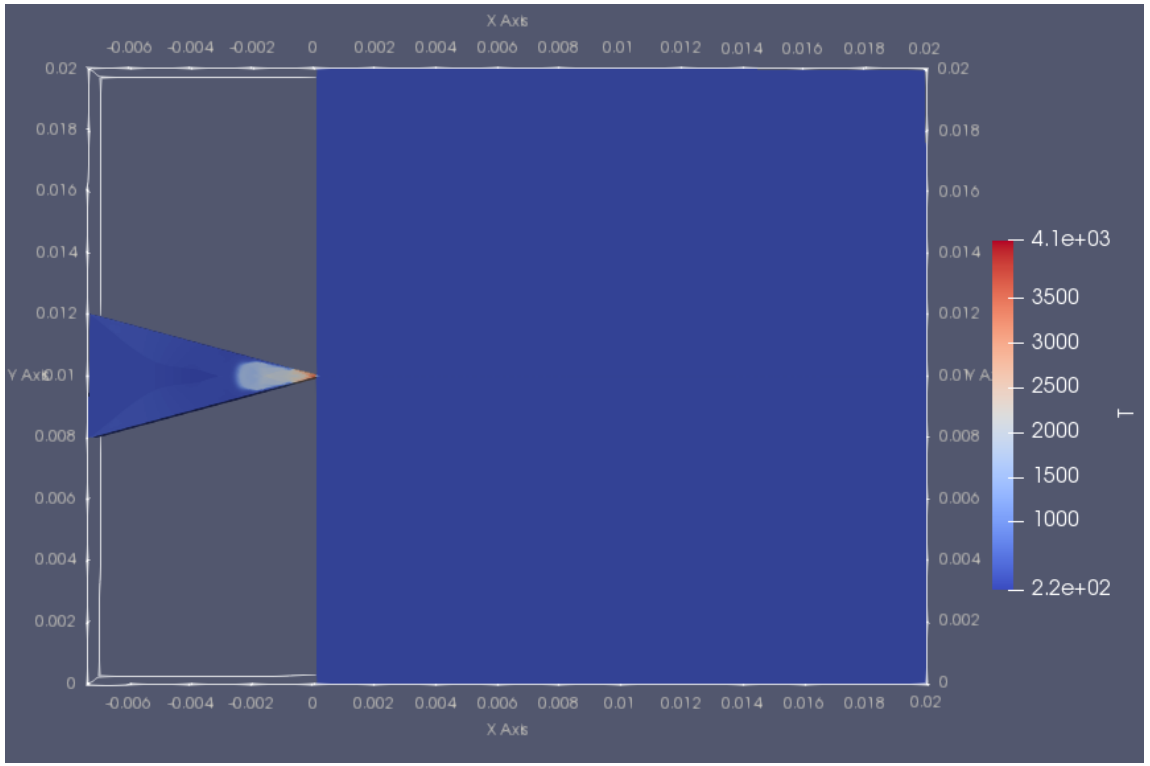
- The gas used throughout this simulation was assumed to be an ideal gas with molecular weight of 11640.3, and adiabatic index of 1.4 .

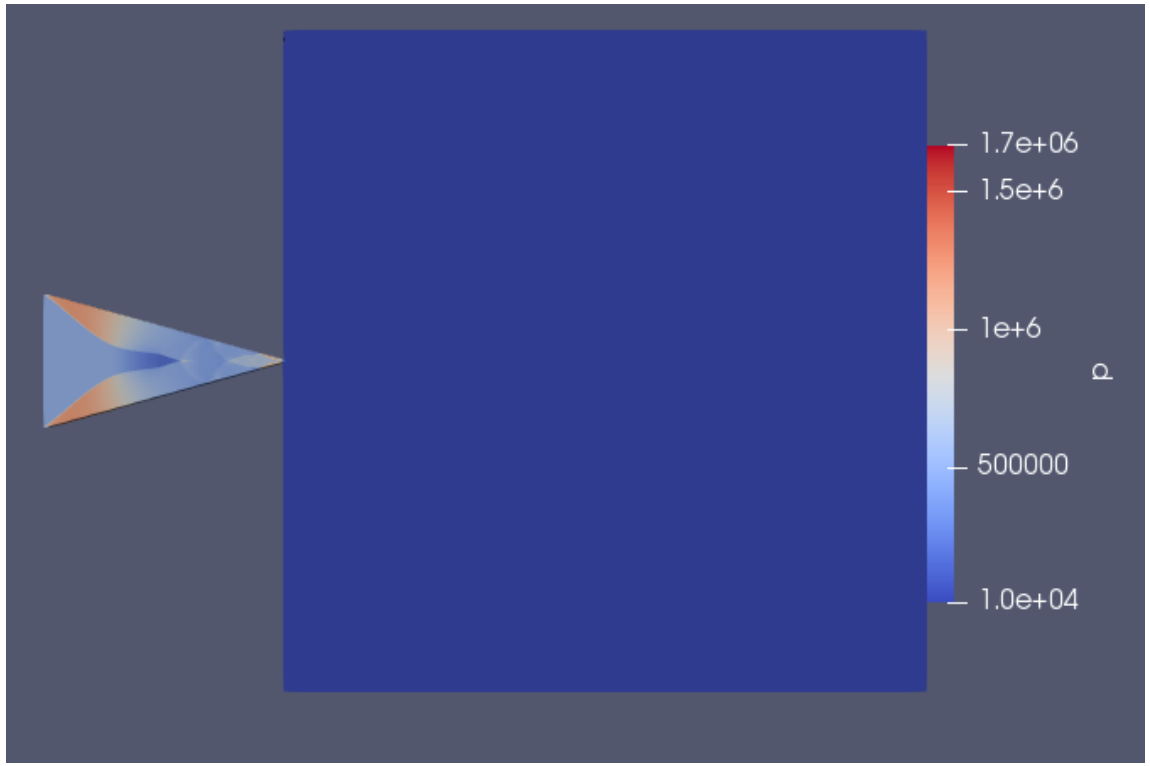
$$V_{sound} = (\gamma\ RT/W)^{0.5}$$



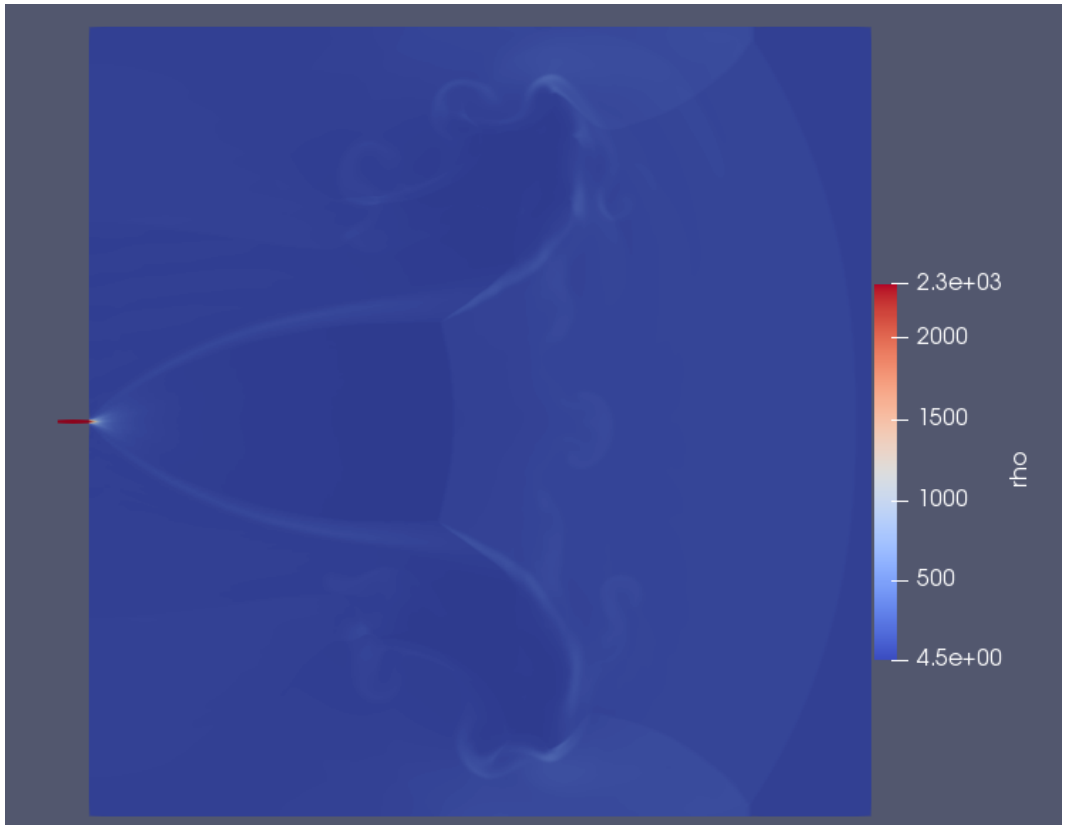


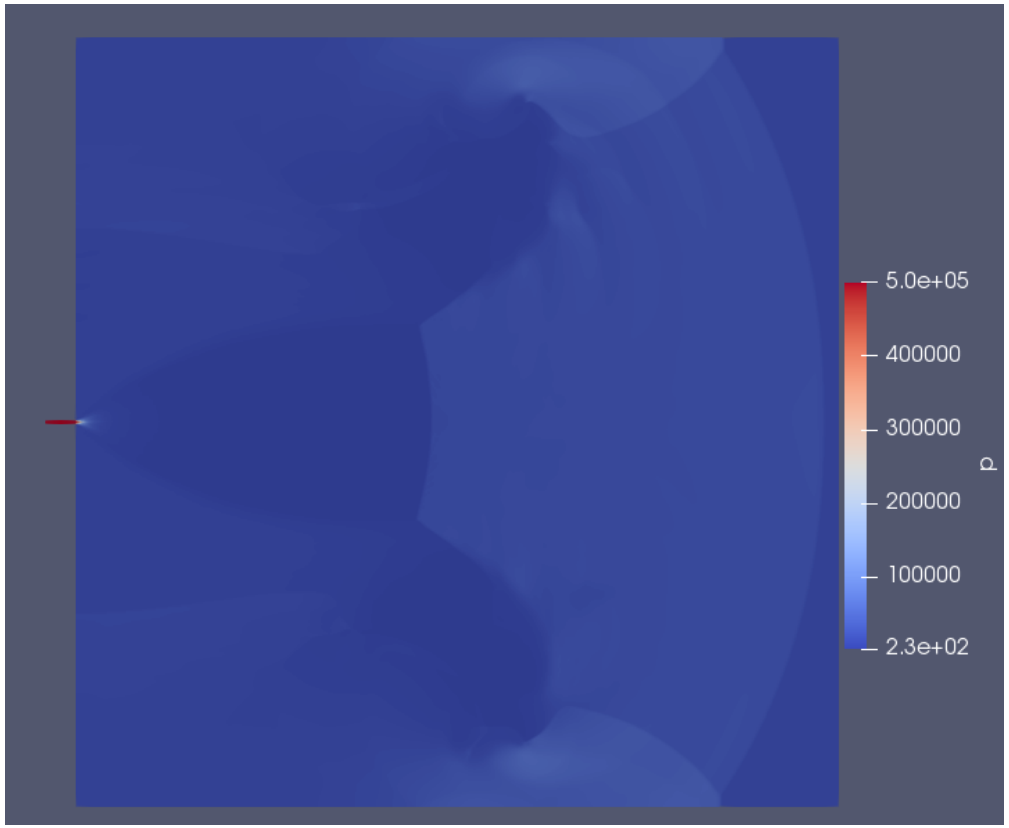
Figures 1 and 2. The pressure and velocity plot of a case with inlet pressure of 5e5pa and ambient pressure of 1e4pa. (before crashing)



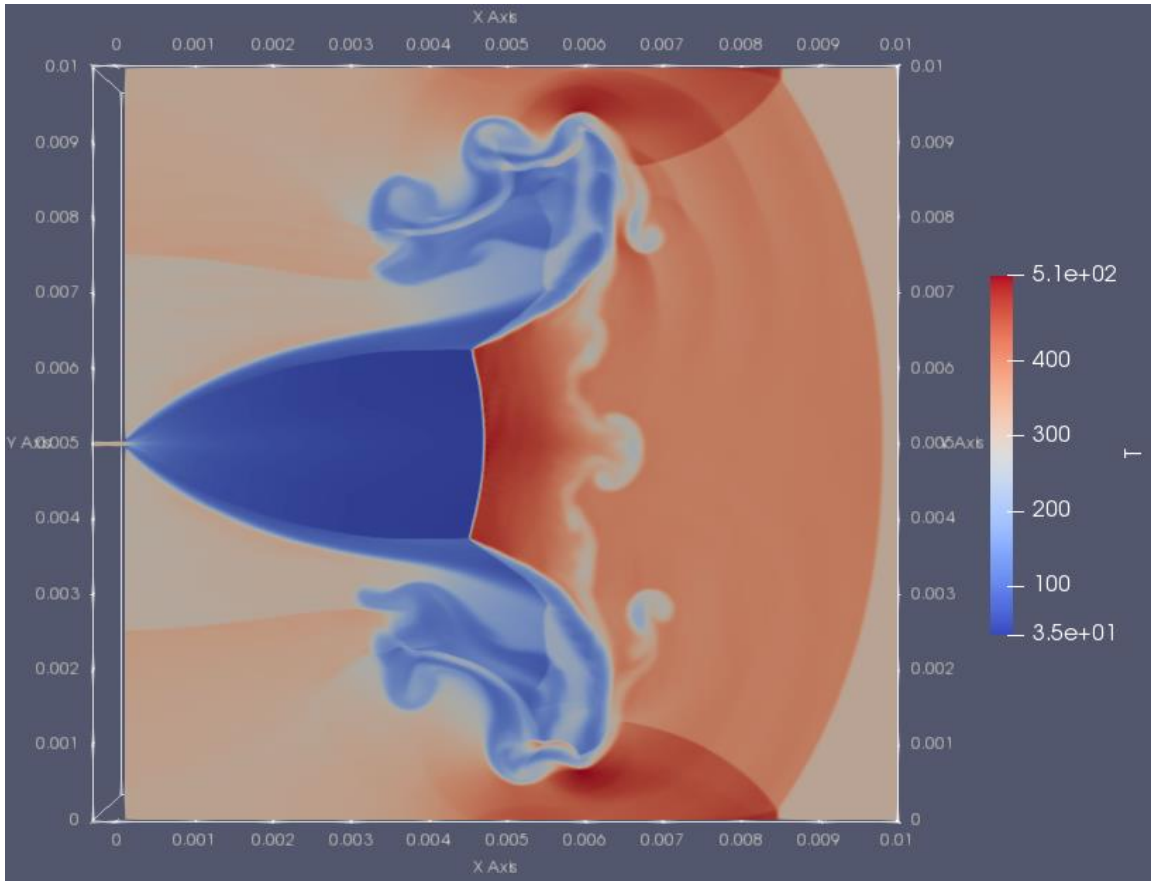


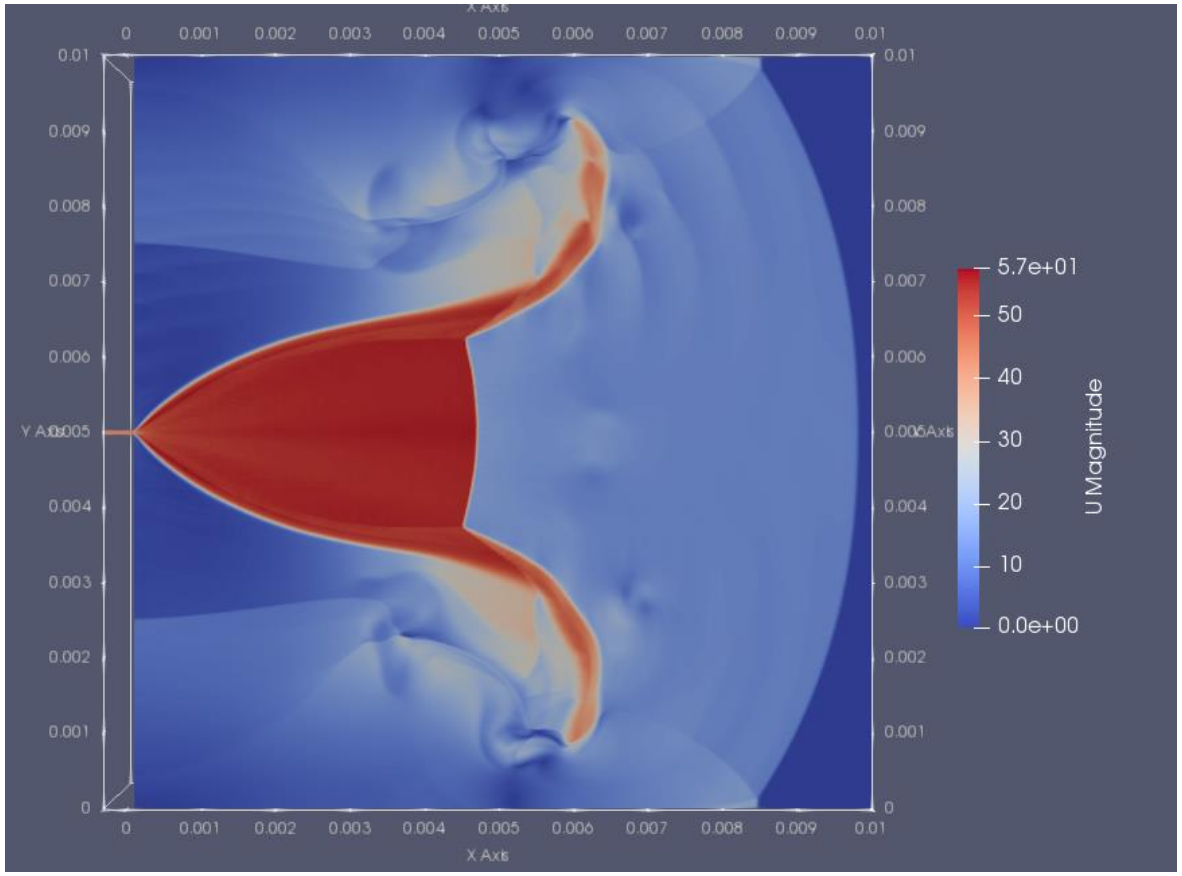
Figures 3 and 4. The pressure and temperature plot of a case with inlet pressure of 5e5pa and ambient pressure of 1e4pa. (before crashing)





Figures 5 and 6. The pressure and density plot of a case with inlet pressure of 5e5pa and ambient pressure of 1e4pa. (stable)





Figures 6 and 7. The temperature and velocity plot of a case with inlet pressure of 5e5pa and ambient pressure of 1e4pa. (stable)

$X_d/d = 2$

$0.67\sqrt{(p_0/p_a)} = 7$

$V_{sound} = 17$