FLUENT - Compressible Flow in a Nozzle- Step 7

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Step 7: Verification & Validation

Solve the nozzle flow for the same conditions as used in class on a 80x30 grid. Recall that the static pressure *p* at the exit is 3,738.9 Pa. The grid for this calculation can be downloaded here.

(a) Plot the variation of Mach number at the axis and the wall as a function of the axial distance *x*. Also, plot the corresponding results obtained on the 50x20 grid used in class and from the quasi-1D assumption. Recall that the quasi-1D result for the Mach number variation was given to you in the `M_1D.xy` file. Note all five curves should be plotted on the same graph so that you can compare them. You can make the plots in FLUENT, MATLAB or EXCEL.

(b) Plot the variation of static pressure at the axis and the wall as a function of the axial distance *x*. Also, plot the corresponding results obtained on the 50x20 grid used in class and from the quasi-1D assumption. Calculate the static pressure variation for the quasi-1D case from the Mach number variation given in `M_1D.xy.`

(c) Plot the variation of static temperature at the axis and the wall as a function of the axial distance *x*. Also, plot the corresponding results obtained on the 50x20 grid used in class and from the quasi-1D assumption. Calculate the static temperature variation for the quasi-1D case from the Mach number variation given in `M_1D.xy.`

Comment very briefly on the grid dependence of your results and the comparison with the quasi-1D results.

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