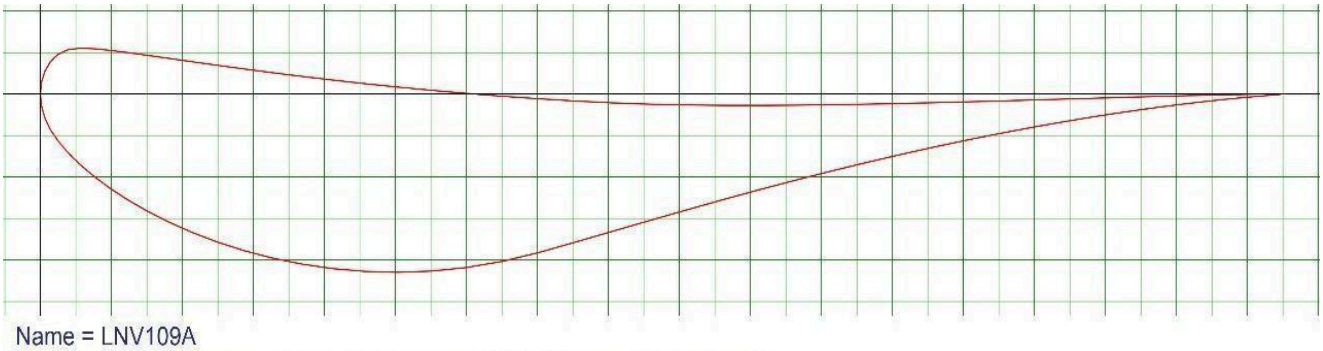
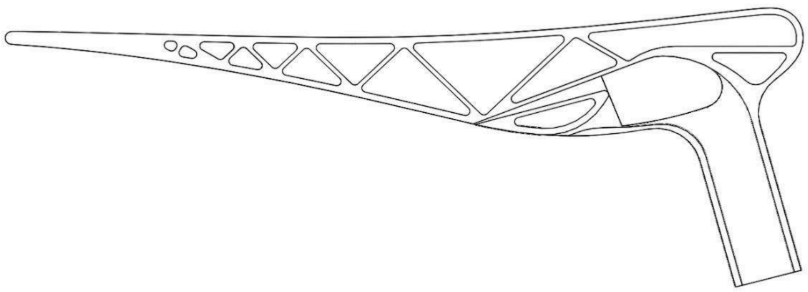
Design of the LNV109A Aerofoil with the required slots:

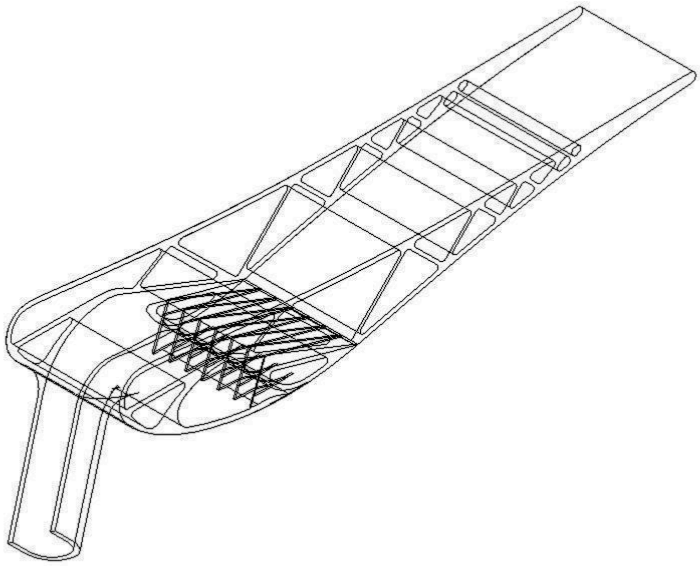


Name = LNV109A

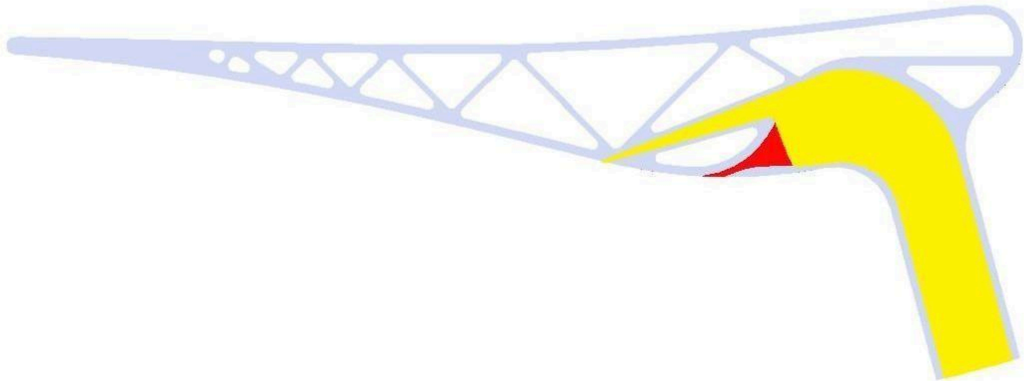
Chord = 350mm Radius = 0mm Thickness = 100% Origin = 0% Pitch = 0°

CAD Design of an LNV109A Aerofoil

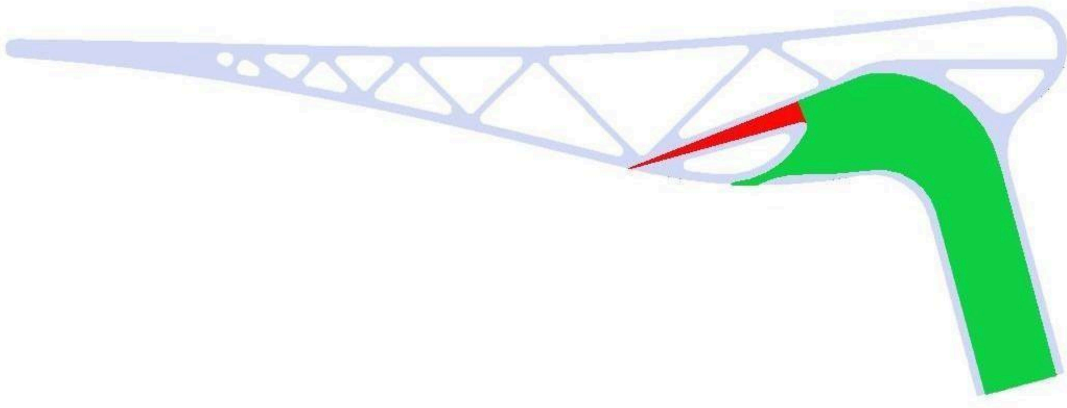




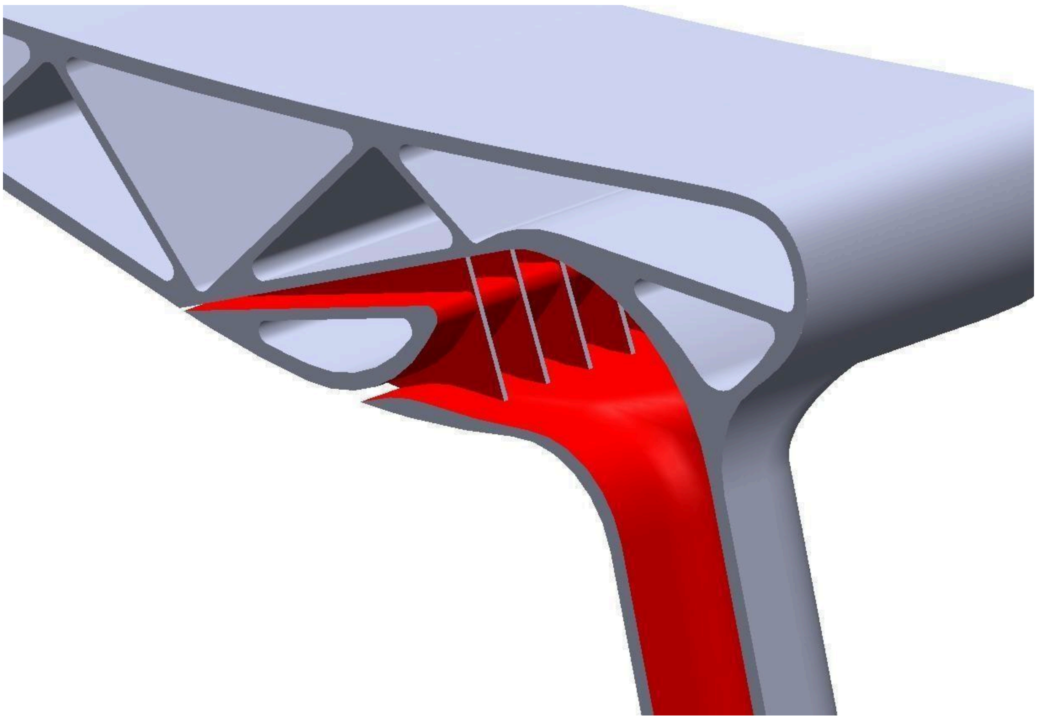
CAD of LNV109A Aerofoil



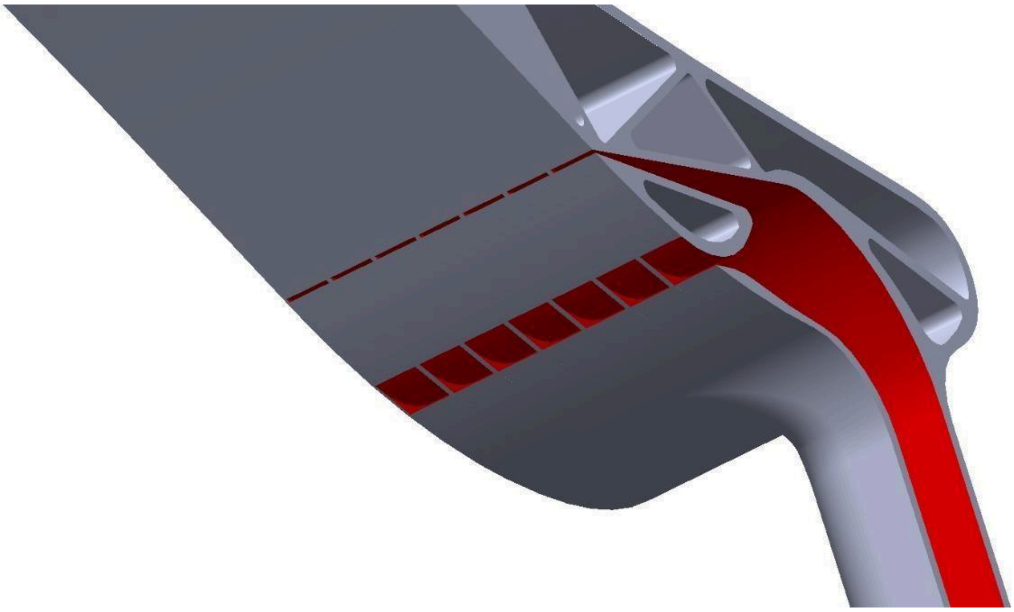
Slot for minimizing drag



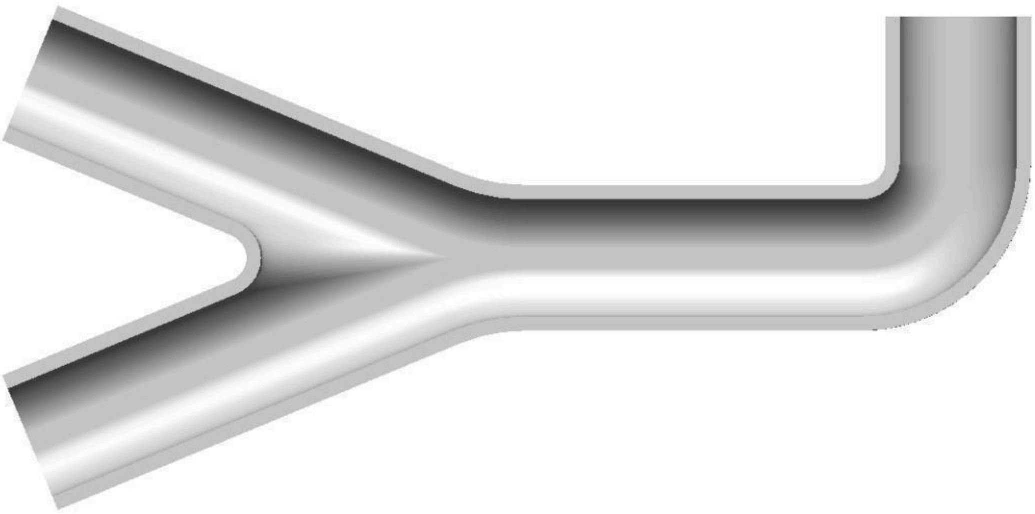
Slot for maximizing downforce



Inlet Slots

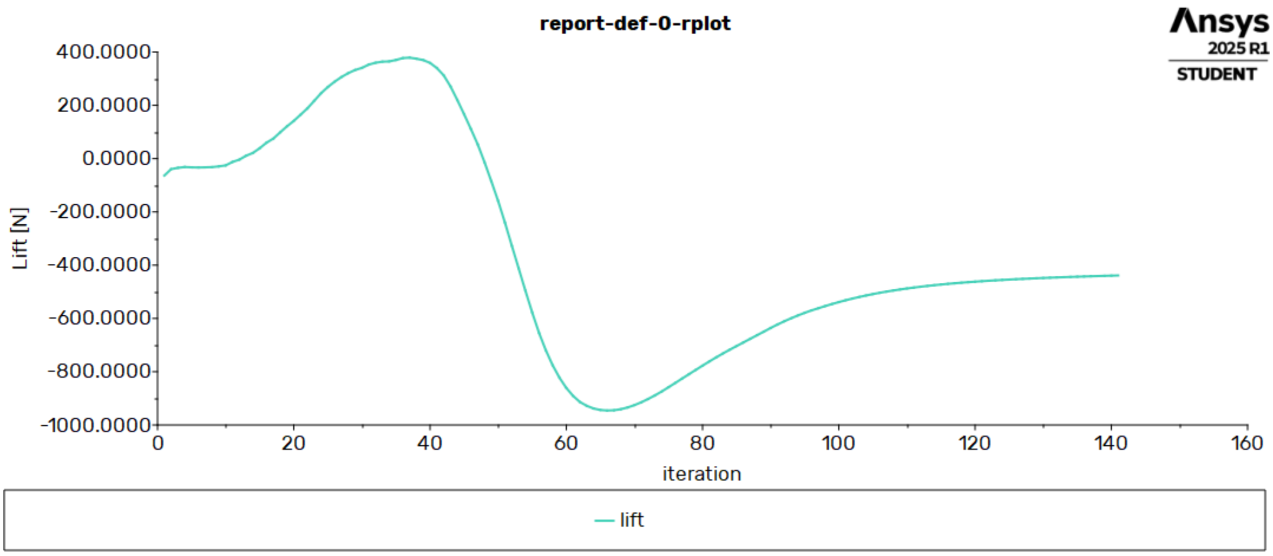


Exit Slots

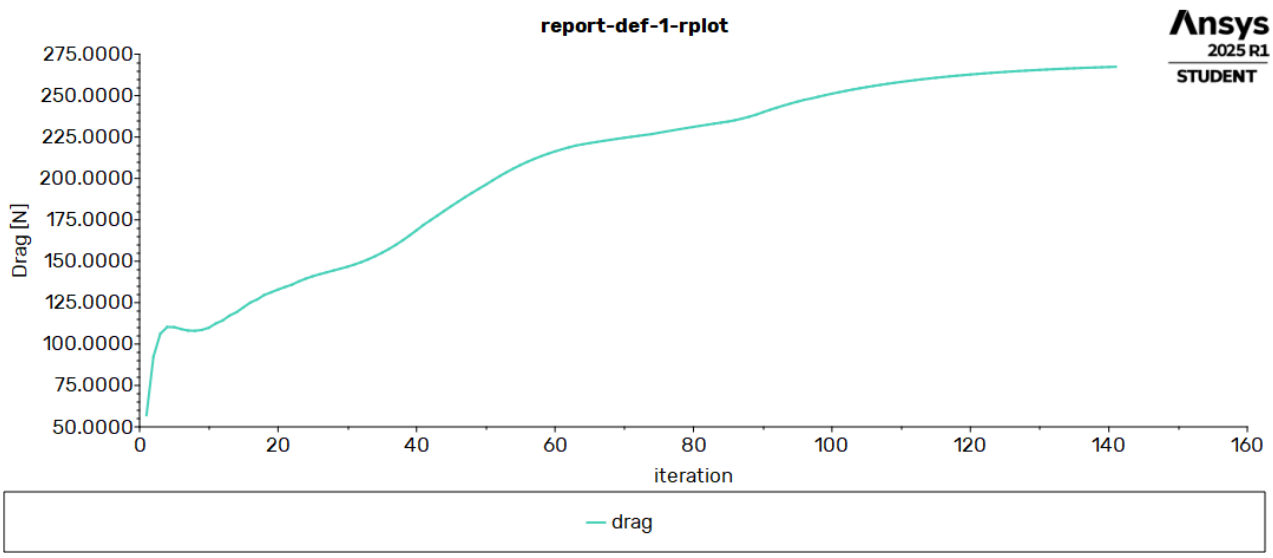


Air Ducts (Upper left - Minimizing Drag; Lower left - Maximizing Downforce; Upper right - Feeds into the Aerofoil Duct)

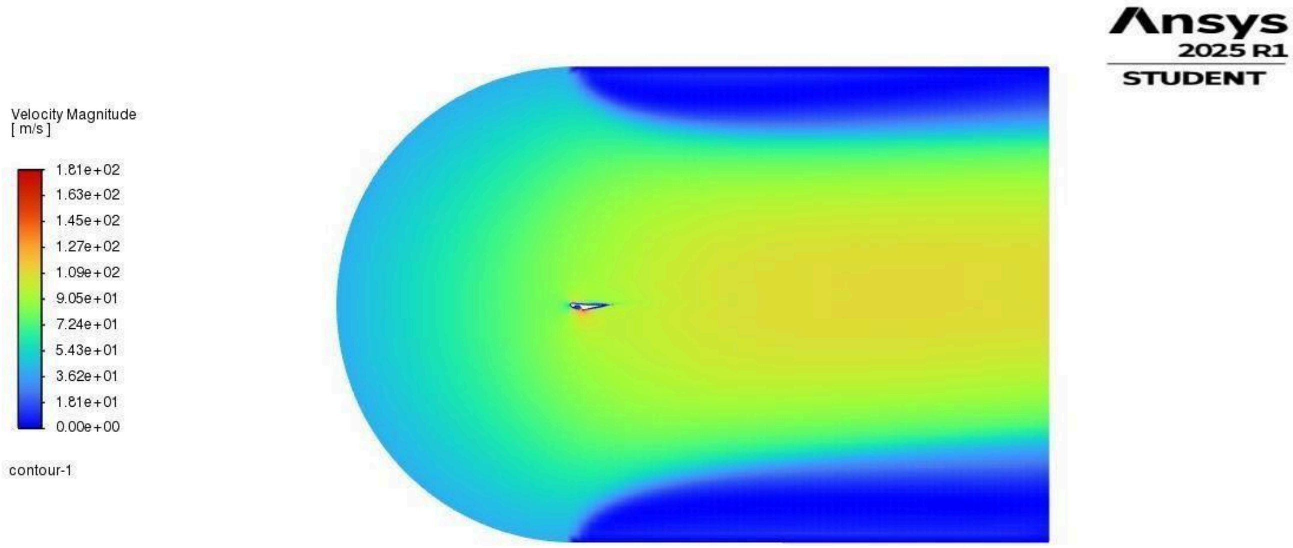
CFD for Downforce on the Inside of the Rear Wing:



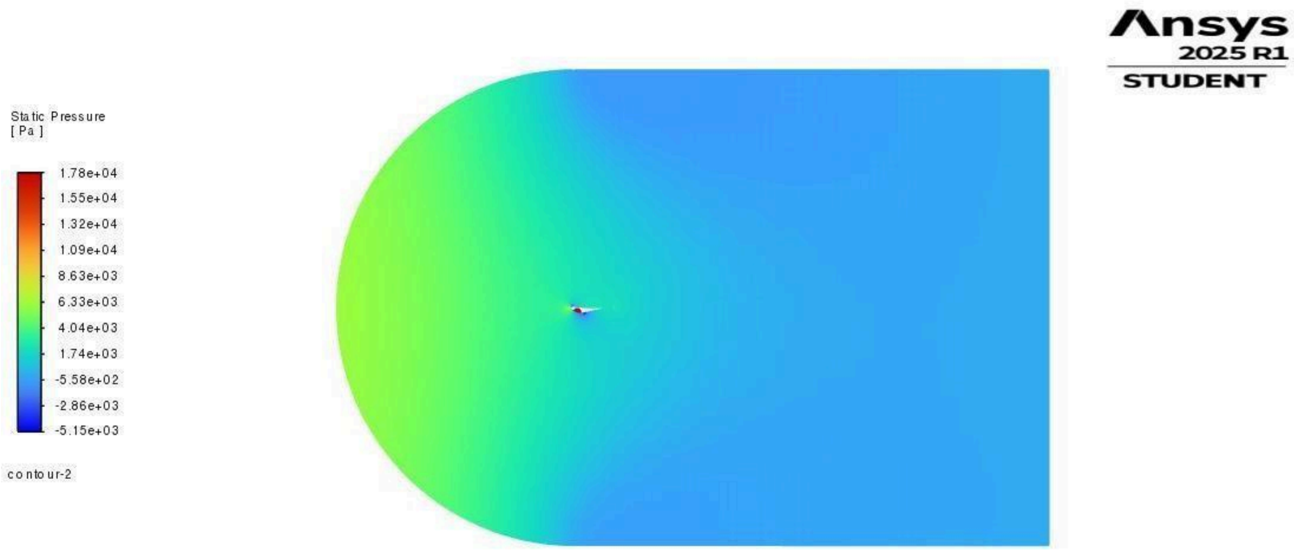
Downforce at 150km/hr



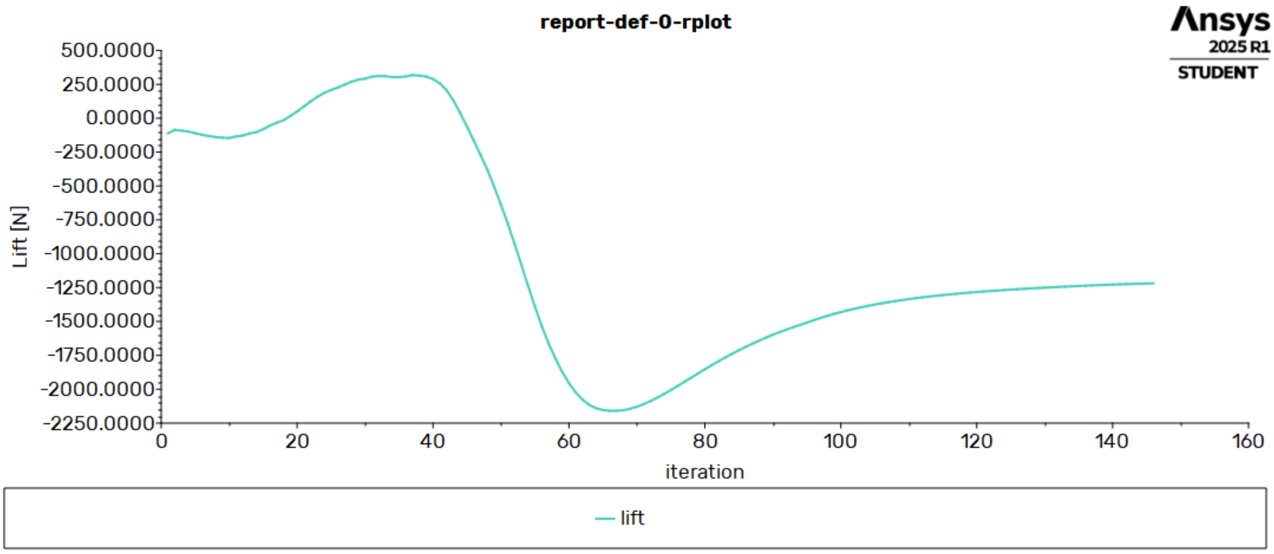
Drag at 150km/hr



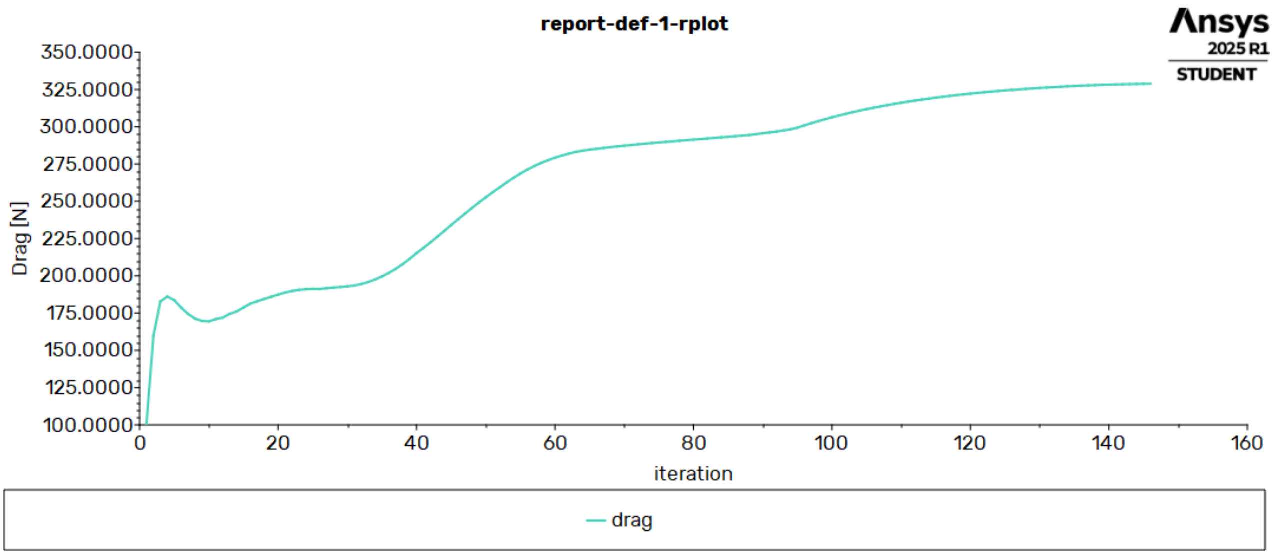
Velocity Contour at 150km/hr



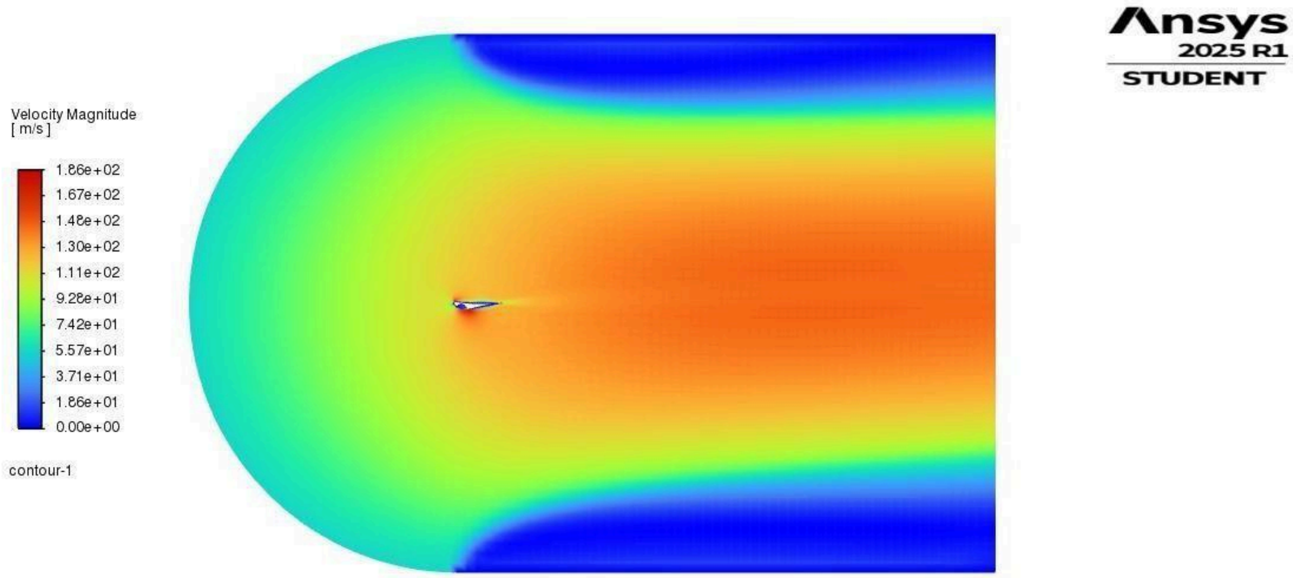
Pressure Contour at 150km/hr



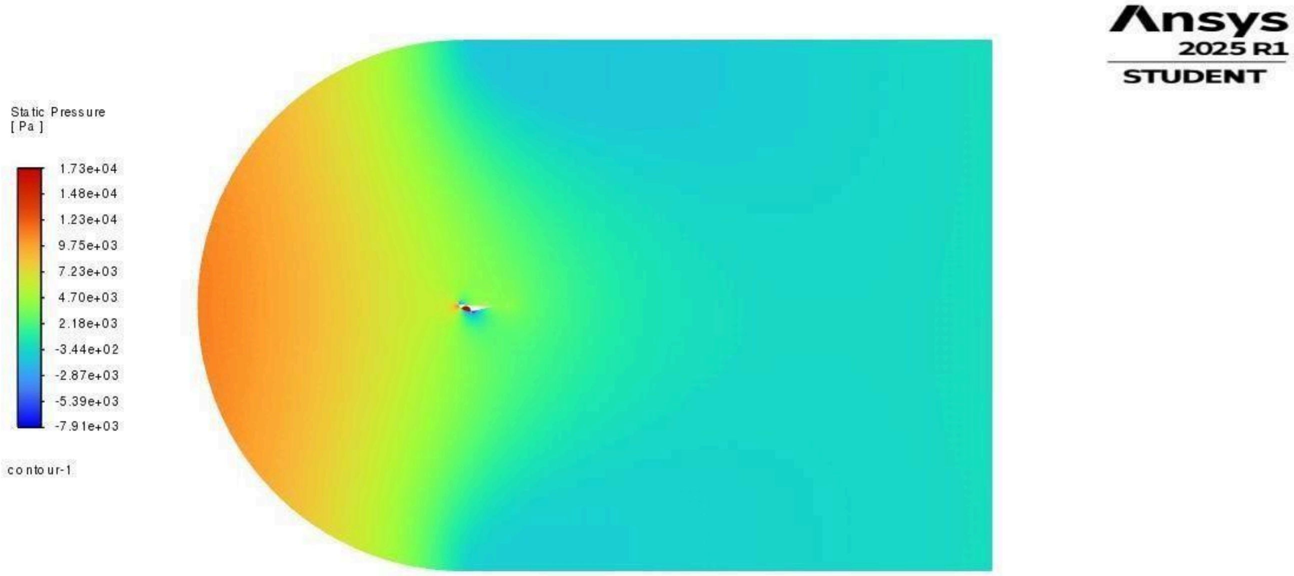
Downforce at 200km/hr



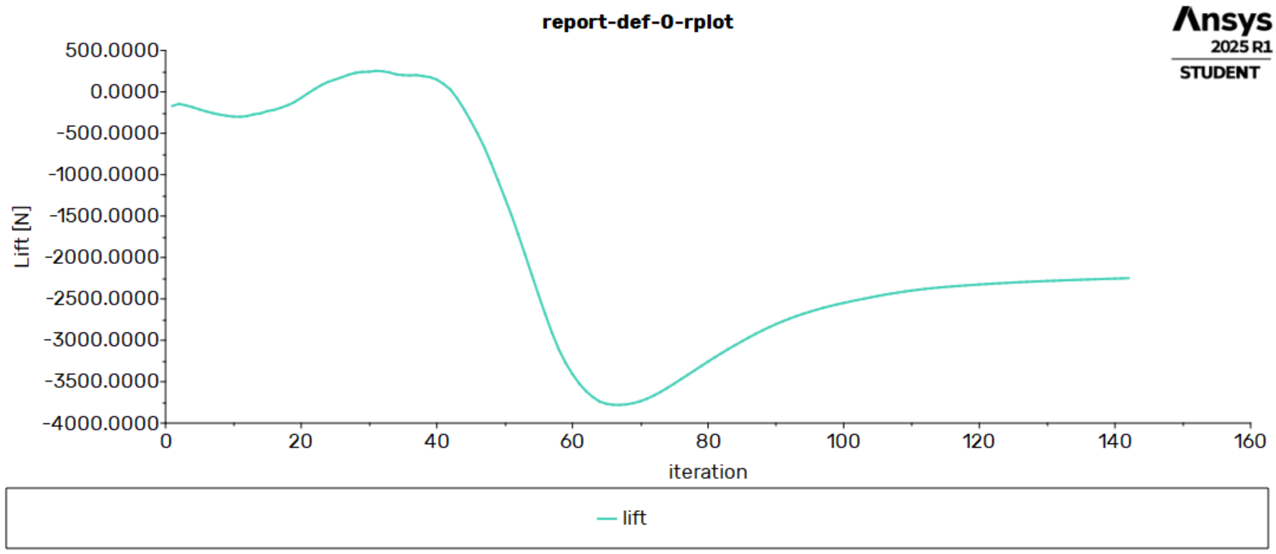
Drag at 200km/hr



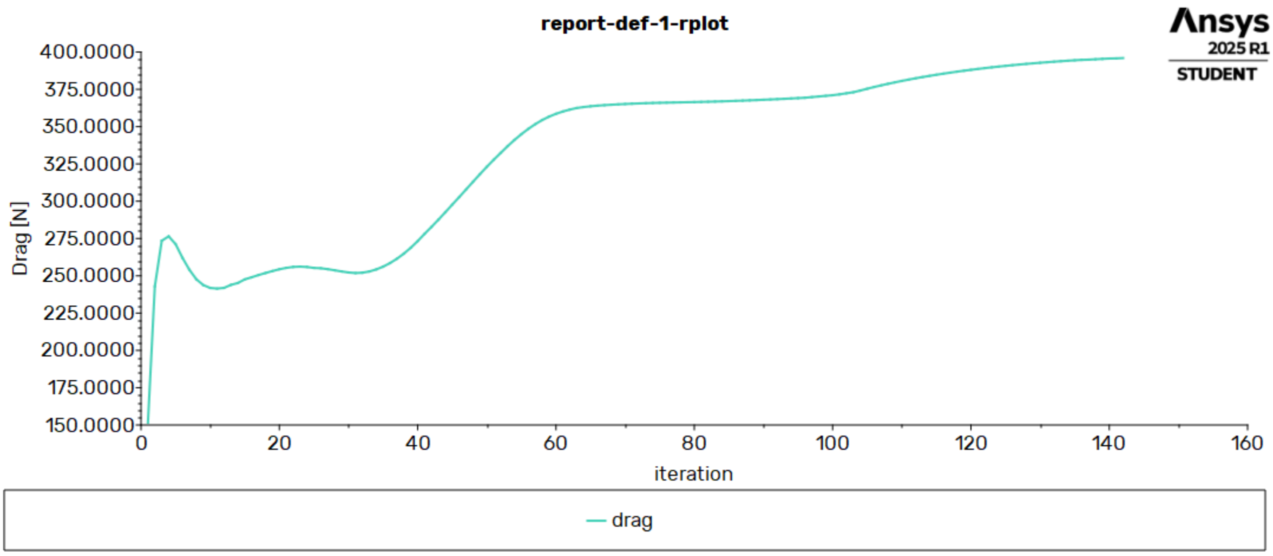
Velocity Contour at 200km/hr



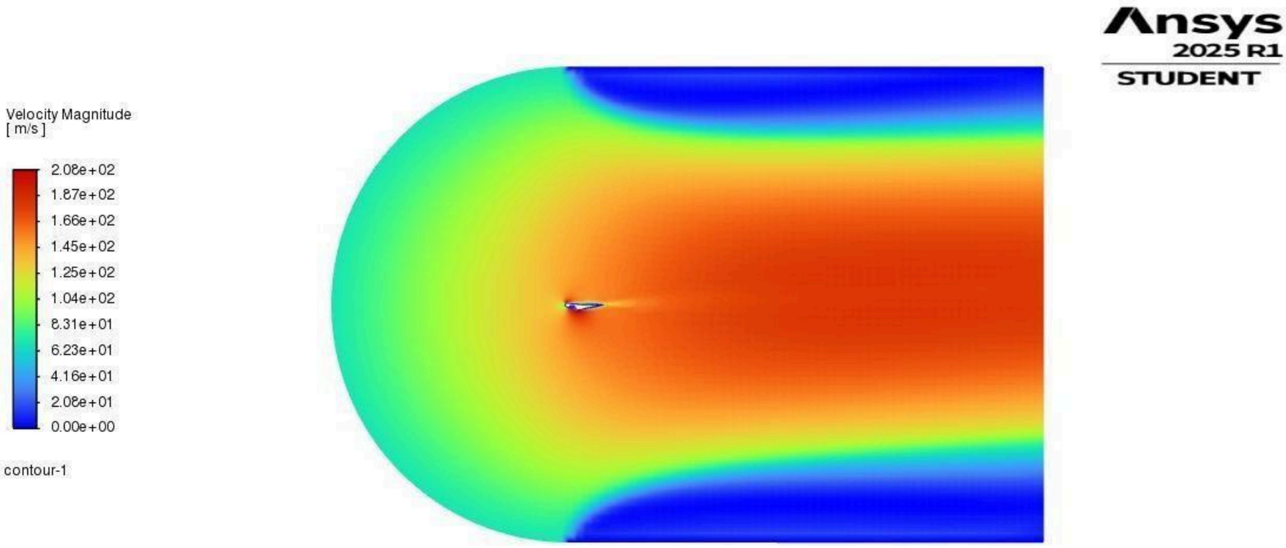
Pressure Contour at 200km/hr



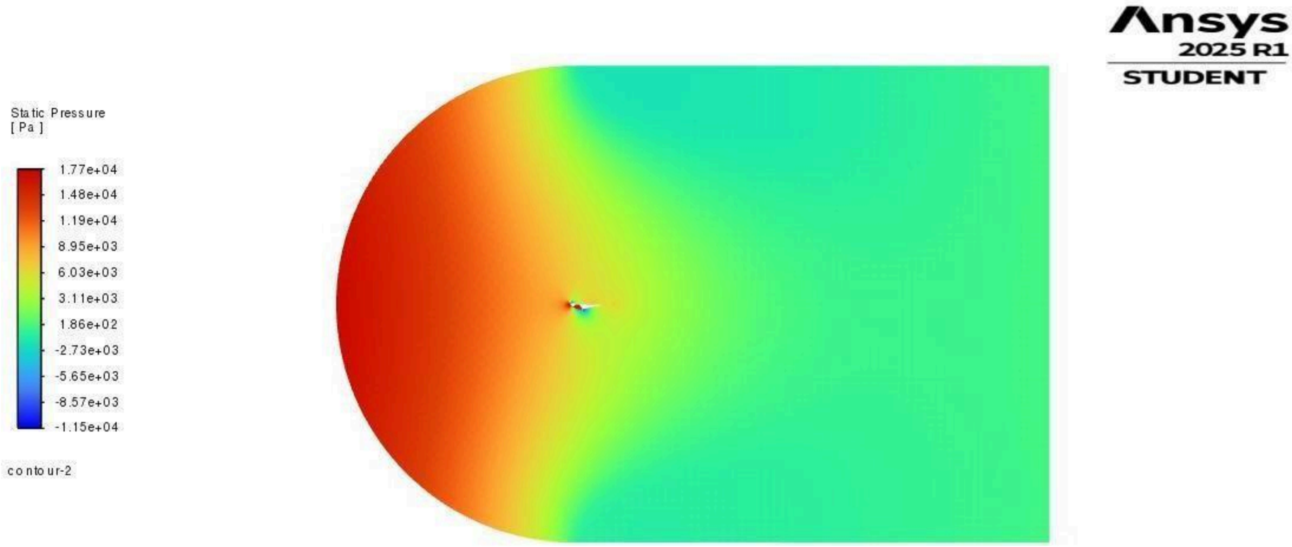
Downforce at 250km/hr



Drag at 250km/hr

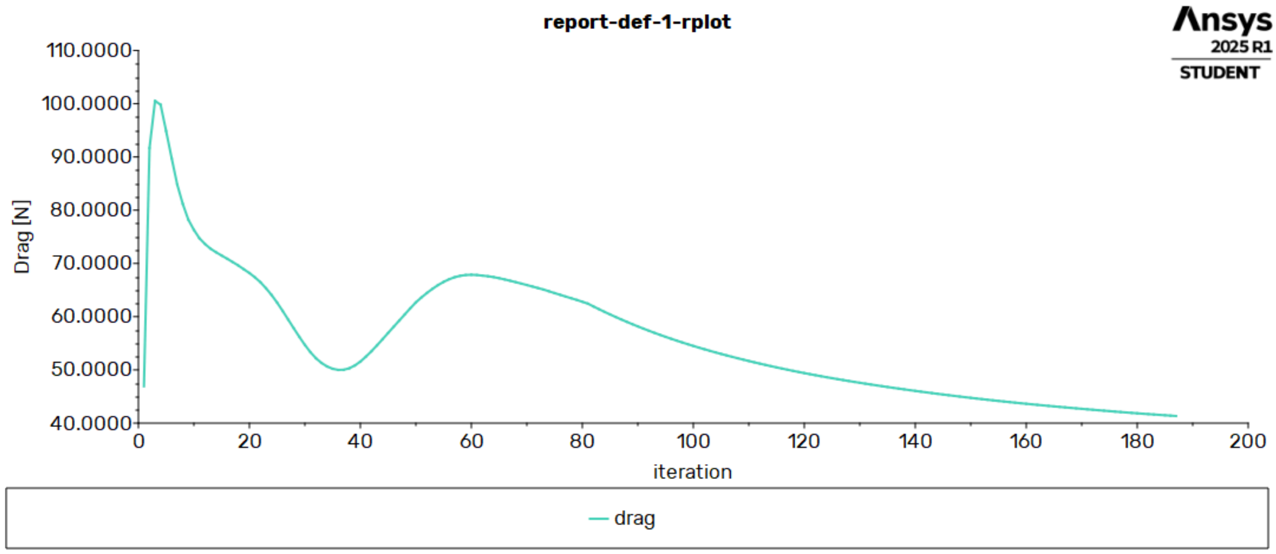


Velocity Contour at 250km/hr

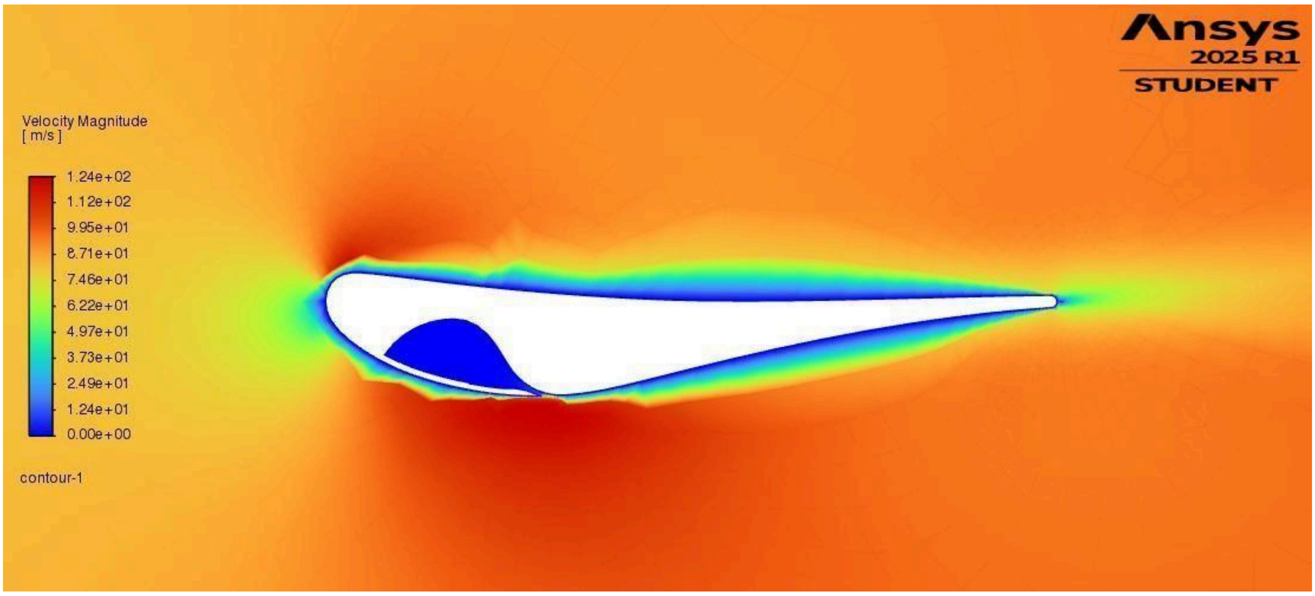


Pressure Contour at 250km/hr

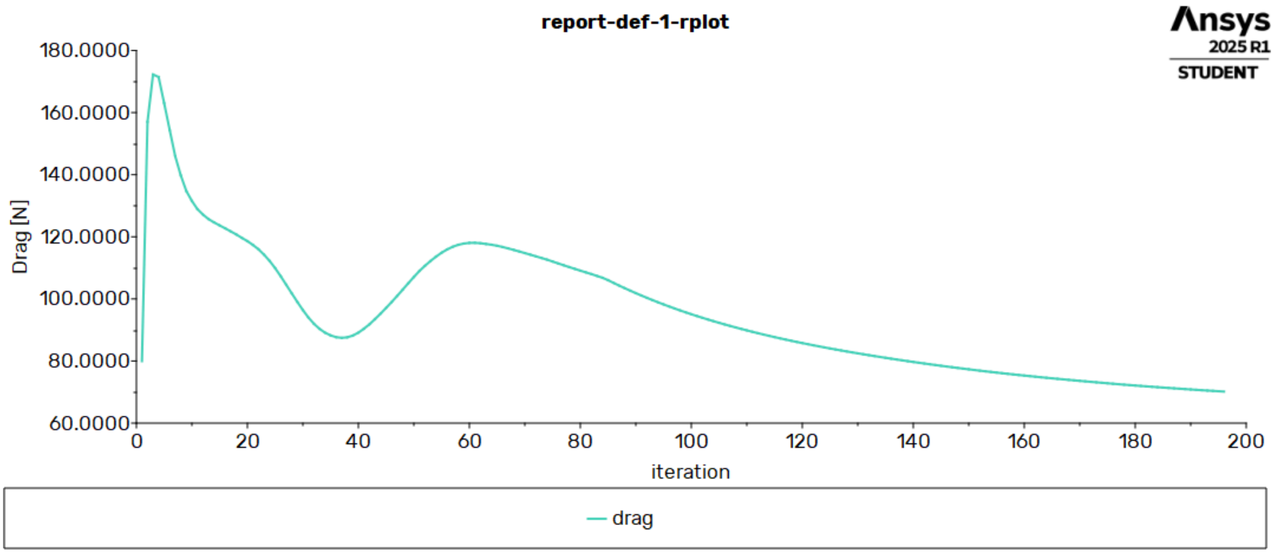
CFD for Drag Reduction due to High-Speed Jet:



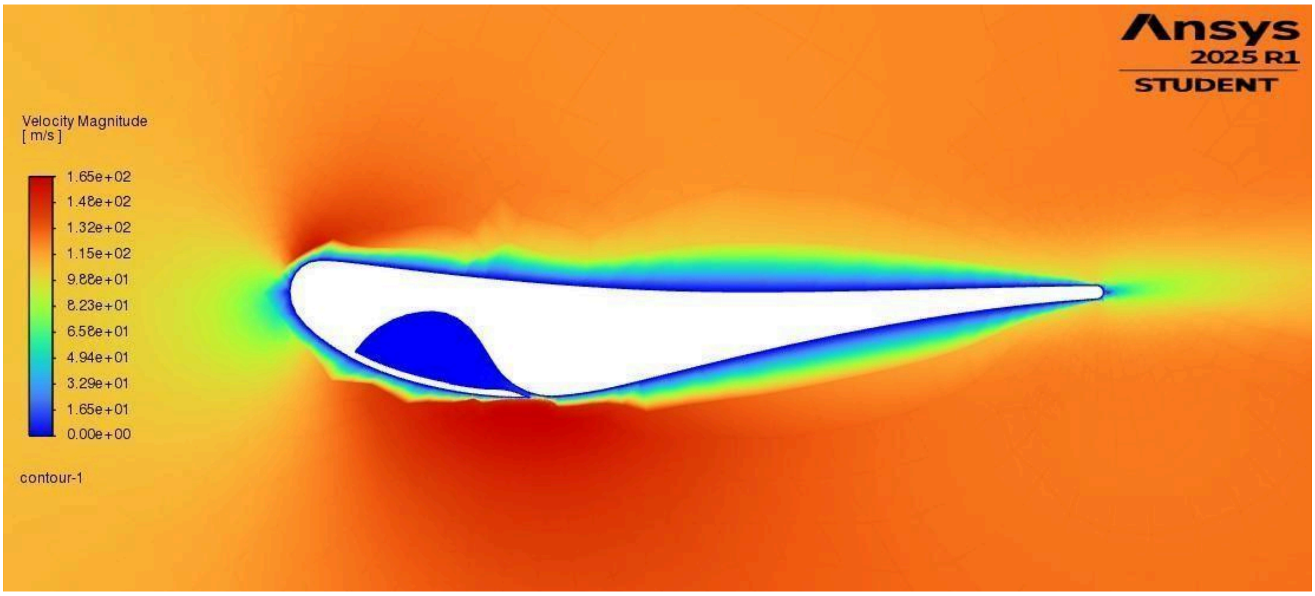
Drag at 150km/hr



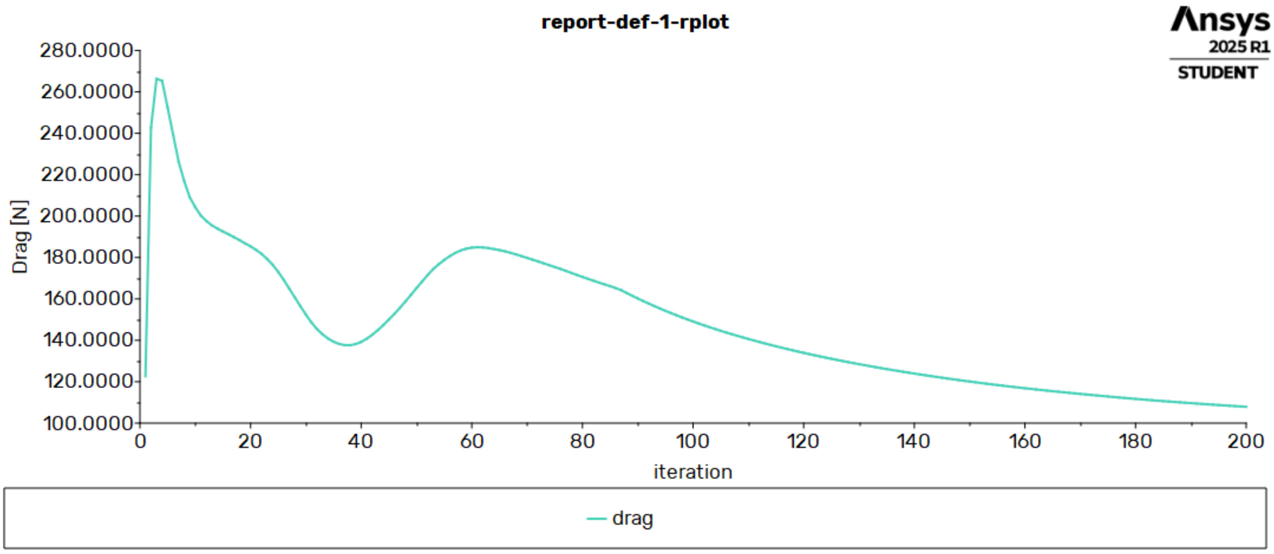
Velocity Contour at 150km/hr



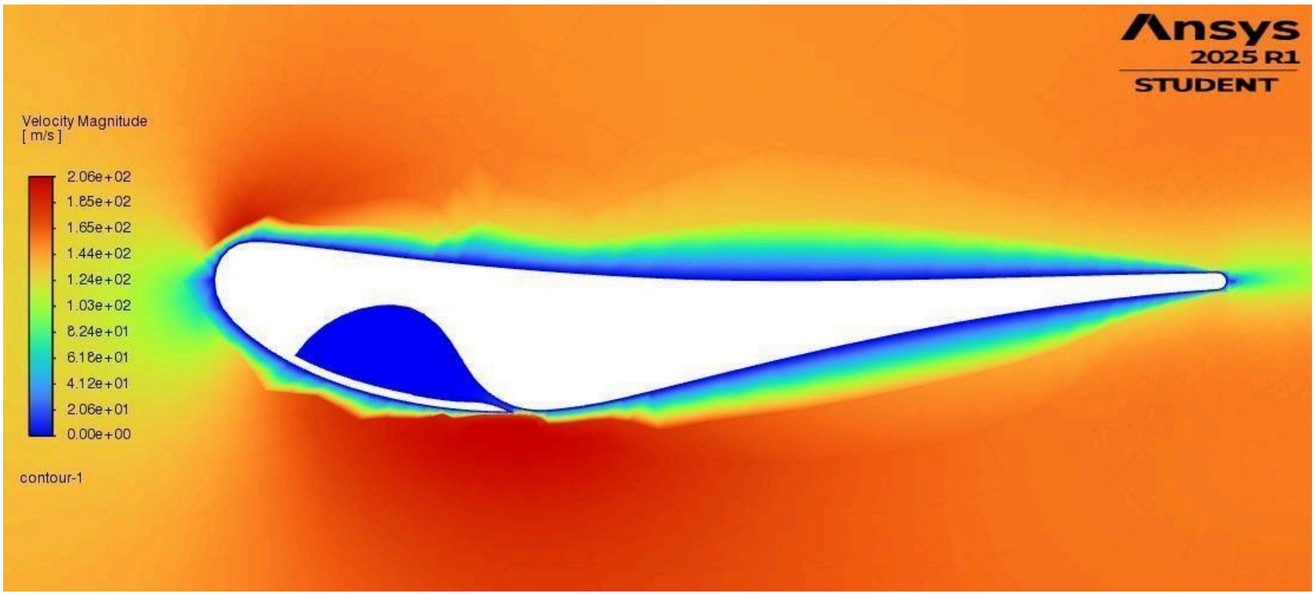
Drag at 200km/hr



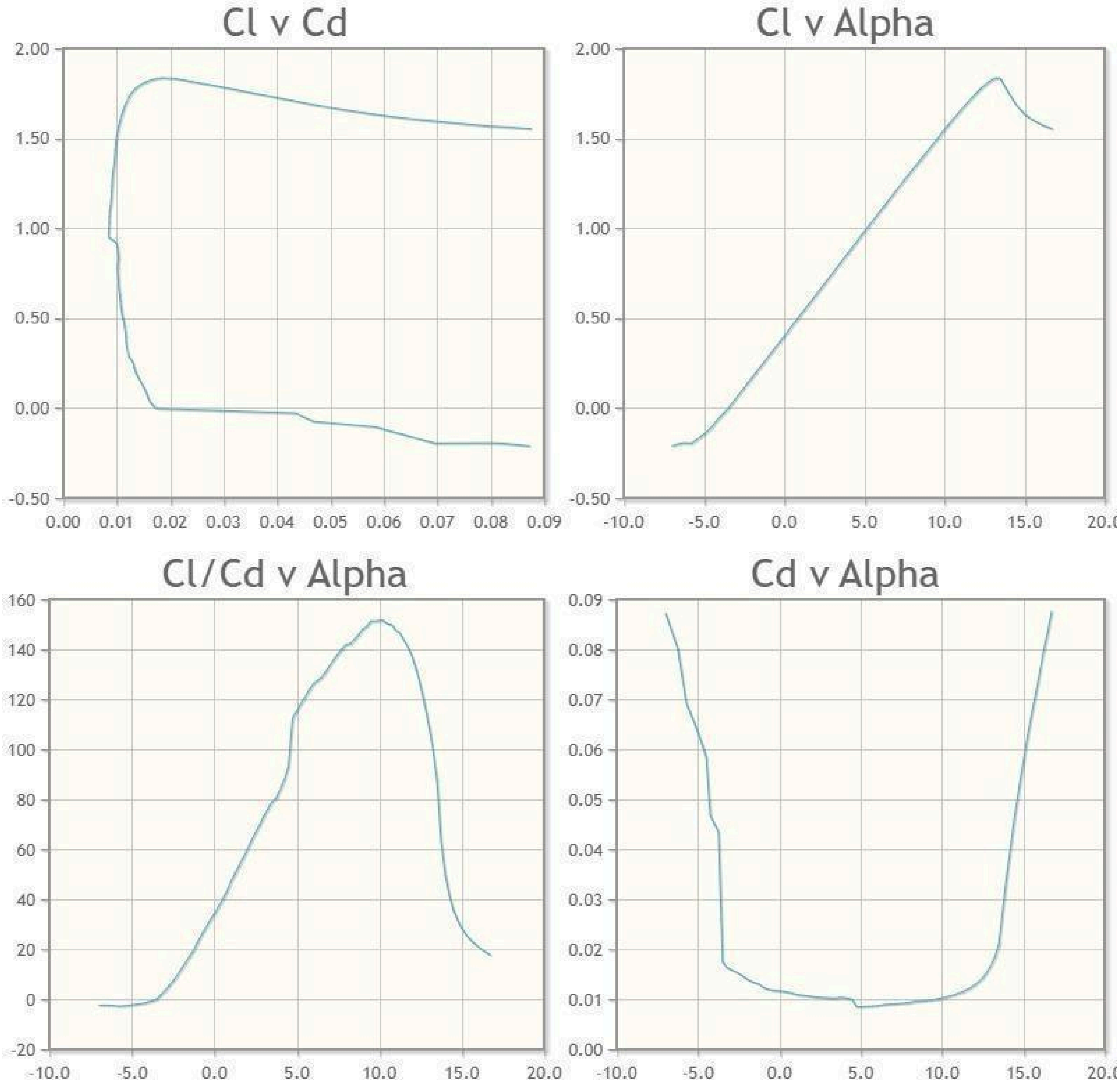
Velocity Contour at 200km/hr



Drag at 250km/hr



Velocity Contour at 250km/hr



Graphs for LNV109A Aerofoil

Conclusions

Additionally, there has been substantial progress made by these models towards reconciling the traditional trade-off between adequate high downforce for cornering stability with the need for low drag in order to achieve the fastest possible speed down a straight line. The results of the application of the suggested model to the rear wing of either a high performance vehicle or a racing vehicle indicate a significant reduction in drag coefficient through straight-line operation at 200 km/h, as well as a gross increase in the downforce generated at or near the inside rear wheel during 1-g cornering at 150 km/h. The redistribution of the aerodynamic loads provided through this process resulted in an increase in tire contact force on the inside rear wheel, which significantly provides a positive impact on traction balance, stability of the vehicle, and how well the vehicle reacts while cornering. The operational feasibility and large level of effectiveness of these adaptive aerodynamic concepts has been affirmatively demonstrated through a combination of computational fluid dynamics studies, as well as analytical calculations, when compared to applicable conventional fixed aerodynamic components.