Estimating Aerodynamic forces over a Re-entry vehicle in Hypersonic flow

A re-entry vehicle is the part of a spacecraft that is designed to return through Earth's atmosphere. Since it enters at very high mach number, the shape of vehicle, material selection and estimating forces acts on the vehicle for given shape becomes very crucial phase in designing.

Espected Outcome:
This project aims to estimate the Aerodynamic forces and estimating convective heat transfer acts over the vehicle at Mach number of 5 using OpenFOAM (Mach number is restricted due to solver issues. Since original free Mach number is 12).
Also aims to compare the Aerodynamic data obtained in numerical simulation with theoretical data obtained through Hypersonic theory.
The dimensions of the vehicle is fixed with refering the Space recovery vehicle dimension.

Solver used : sonicFoam.