

Effect of Mesh Size on the Supersonic Viscous Flow Parameters around an Axisymmetric Blunt Body

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Abstract : The aim of this work is to analyze a viscous flow around the axisymmetric blunt body taken into account the mesh size both in the free stream and into the boundary layer. The resolution of the Navier-Stokes equations is realized by using the finite volume method to determine the flow parameters and detached shock position. The numerical technique uses the Flux Vector Splitting method of Van Leer. Here, adequate time stepping parameter, CFL coefficient and mesh size level are selected to ensure numerical convergence. The effect of the mesh size is significant on the shear stress and velocity profile. The best solution is obtained with using a very fine grid. This study enabled us to confirm that the determination of boundary layer thickness can be obtained only if the size of the mesh is lower than a certain value limits given by our calculations.

Keywords : supersonic flow, viscous flow, finite volume, blunt body

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