

عنوان مقاله:

Numerical Simulation of Interaction of Sonic Jet with High Speed Flow over a Blunt Body using Solution Mapped
Higher Order Accurate AUSM+-UP Based Flow Solver

محل انتشار:

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خلاصه مقاله:

The development of a numerical procedure based on AUSM+-UP scheme using higher order accurate reconstruction method is presented. A code based on this is used for the simulation of film cooling for reentry module. Here the convective fluxes are evaluated using AUSM+-UP scheme. Least square based derivative evaluation is used to compute diffusive fluxes. The numerical code has been successfully validated using standard experimental data for counter flow injection. Analysis has been carried out for a simple axisymmetric reentry module with and without film cooling, for a free stream Mach number of ۸.۰. The predicted adiabatic wall temperatures were compared for both the cases. Film cooling is found to be effective for this configuration and injected coolant remains confined to the boundary layer formed by the free stream from nose tip to the aft end of the module. Numerical simulation of film cooling provides vital information required for design of effective cooling system such as number of counter flow injectors, their dimensions and locations, injection pressure and temperature, mass flow rate required etc

کلمات کلیدی:

+Higher order reconstruction, Hypersonic flow, sonic jet, UP schemes, Film cooling, Finite volume method, AUSM

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