NUMERICAL ANALYSIS AND DESIGN OPTIMIZATION OF BLUFF BODY USING SPIKE

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Abstract

The drag force caused on the re-entry vehicle and for missile, cursing at supersonic speed will result in Aerodynamic heating of the body. To minimize the aerodynamic heating and drag, designing of bluff body is an important aspect. This paper deals with the design optimization of bluff body using spike. Computational studies have been made in ANSYS FLUENT to obtain the effect of spike shape and length over a bluff body at supersonic Mach number of 2 at zero angle of attack. In this paper numerical analysis on conical bluff body integrated with different spike configurations were carried out using ANSYS software packages. Computations have been made on three spike configurations i.e., sharp, blunt and aerospike of different lengths. Larger the recirculation zone, reduces coefficient of drag. It has been observed that with an increase in spike length the pressure fluctuations increase and with the change in shape to blunt spike and sharp spike the fluctuations decrease.

Keywords: Bluff Body, Design Optimization, Sharp Spike, Spike Length