

INVESTIGATION OF CONJUGATE HEAT TRANSFER ON HYPERSONIC BLUNT BODY

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ABSTRACT

This study focuses on conjugate heat transfer in hypersonic blunt bodies, exploring the interaction between the aerodynamic flow field and surface heat transfer. Using numerical simulations and experimental validations, it examines how heat transfer between the high-speed flow and the solid surface affects aerodynamic performance and thermal protection systems. The research integrates fluid dynamics and heat transfer to enhance understanding of thermal management for hypersonic vehicles, addressing challenges like extreme heat fluxes and thermal gradients. The insights aim to advance the design of more efficient and reliable aerospace technologies for future missions.

Keywords: Hypersonic blunt bodies, Conjugate heat transfer, Adverse pressure gradients, Thermal management, Numerical simulations, Aerodynamic performance, Thermal protection systems, Fluid dynamics, Heat transfer phenomena, Thermal gradients.

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