

AERO-PROPULSIVE CHARACTERIZATION OF A FLIGHT VEHICLE WITH TWO SIDE-JETS

R. Balasubramanian; Jessy Prabhu Dayal; R. Krishnamurthy; Debasis Chakraborty
Defence Research and Development Laboratory (DRDL)
Kanchanbagh Post, Hyderabad-500 058
Email : debasis_cfd@drdl.drdo.in; debasis_drld@yahoo.co.in

Abstract

Numerical simulations were carried out to study the aero-propulsive characteristics of a flight vehicle using in-house developed Reynolds Averaged Navier-Stokes code CERANS. The analyses involved subsonic external flow with inclined supersonic dual sustainer jets at various angles of attack, roll orientations and side slip. The control characteristics of the configuration are evaluated for the flow with and without sustainer jets. Numerical simulations indicated that the jet plume exhausting out of the scarf sustainer nozzle grazed and clung to the airframe for a considerable downstream distance causing serious damage to the airframe. This numerical study led to an important design change of the sustainer nozzle shape from 'scarf' to 'conical' which alleviated plume interference problem with the airframe.

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