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Title : STEADY PRESSURE MEASUREMENTS IN THE STRAP-ON BOOSTER INTERFERENCE REGION OF 1/20 SCALE ASLV CONFIGURATION.

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Author(s) : SAJEER AHMED, S. SELVARAJAN, B.S.VARAMBALLY, A.E.SIVARAMAKRISHNAN, S. PANDYAN

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Abstract :

Wind tunnel studies were carried out to obtain pressure distribution in the strap-on booster interference region of 1/20th scale Augmented Satellite Launch Vehicle model configuration. Tests were done in the 1.2m tunnel at NAL in the Mach number range of 0.5 to 2.5 for the clean configuration as well as with spring housing attachments on the strap-on boosters. Both the model configurations with the boosters strapped on to the core vehicle in the horizontal plane (pitch) and in the vertical plane (yaw) were tested for incidences at 0, 4 and -4 deg. In addition pressure measurements were also done on the core vehicle alone at Mach numbers 2.1, 2.5 and 3.0 for 0, ±4 degree incidences. The test Reynolds number was varied from 0.7 to 1.3 millions based on the maximum diameter of the model.

The pressure distribution showed significant interference effects of boosters on the core vehicle. It is observed that the positive pressure peak associated with flow compression at the flare junction increases with increase in Mach number. In the pitch plane the normal force distribution remains positive along the core vehicle whereas in the yaw plane it is of less magnitude.