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SCALE LCA HIGH SPEED AIR INTAKE
MODEL

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Abstract :

This report presents the mechanical design features, materials used and the structural design details of the 1:4.405 Scale LCA High Speed Air-intake Model. The model design makes use of advanced composite materials and steel bulkheads/inserts. A steel bulkhead acts as support for the sting mounting of the model in the tunnel and also provides support points for mounting the front fuselage, duct, wing, rear fuselage frame and the rear fuselage cover. The model design allows necessary yaw angle capability, the required pitching motion, mass flow control through the duct, and variation of heat exchanger mass flow. Modular concept has been fully used in the model design so as to obtain all the configurations of the model easily. Basic structural analysis making use of strength materials approach was carried out for all the newly designed components, since the model makes use of many components of a model tested in an earlier campaign. Each component of the model is analysed to determine the working stress level under its critical tunnel operating condition.