National Aeronautics and Space Administration

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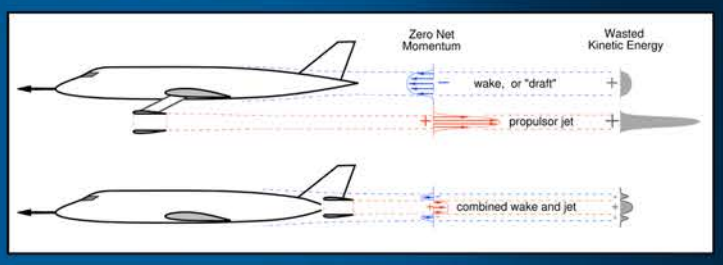
NASA 8- by 6-Foot Supersonic Wind Tunnel

BOUNDARY LAYER INGESTION (BLI)

BLI Inlet Distortion-Tolerant Fan Wind Tunnel Experiment

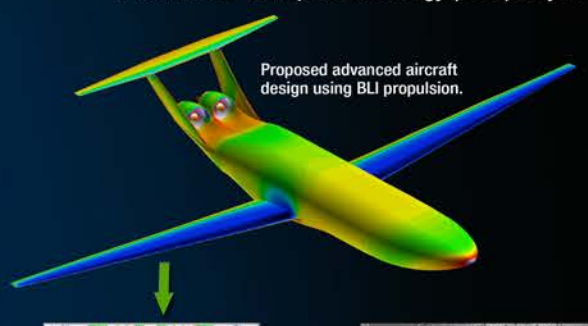
Benefits of BLI for Aircraft Propulsion

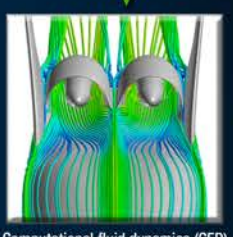
- Propulsive power is needed to generate thrust to overcome aircraft drag (aircraft boundary layer) as it flies.
- Energy is wasted as excess velocity in the aircraft wake and in the exhaust jet from the engines.
- BLI propulsion pulls in low velocity boundary layer air and accelerates it producing a smaller wake and reducing drag.
- Less drag means less power is needed for the aircraft to fly at the same speed, so less fuel is burned by the engines.
- The more boundary layer ingested, the better the efficiency of the engines and the less fuel is burned.



Computational Predictions Validated By Experimentation

Advanced Air Transport Technology (AATT) Project





Computational fluid dynamics (CFD) prediction of BLI propulsion performance.

Wind tunnel verification of BLI propulsion to improve performance and reduce fuel burn.

System-Level Verification of BLI Propulsion Concept With Wind Tunnel Testing