

FlightStream[®] is a surface-vorticity flow solver designed to allow users to rapidly develop compressible and incompressible subsonic aerodynamic assessments during the design process. Applications include UAVs, Aerostats, high subsonic military aircraft, propellers, helicopters, store separation, high-lift components, and more! FlightStream[®] is the most versatile aerodynamic analysis tool for aerospace applications today.

VISCOUS-COUPLED FLOW SOLUTIONS

FlightStream[®] has a fully viscous-coupled non-linear flow solver that allows the accurate physics-based capture of boundary layer aerodynamics, flow separation and post-stall aerodynamics. FlightStream[®] is the only "panel-method" solver capable of such flow modeling for early design aerodynamics requirements. This is a perfect tool for the conceptual and preliminary design of aerospace vehicles! Viscous-coupled capabilities include the ability capture non-linear aerodynamics, onset of stall, prediction of C_{LMAX} and post-stall loads. This capability has now been validated for a range of case studies.



MODELING JET ENGINES

THE FLIGHTSTREAM[®] JET ACTUATOR: EXHAUST JETS WITHOUT A VOLUME MESH.

FlightStream[®] allows you to model engine inlets, exhausts and engine propulsion performance during the same solver run. Application of velocity and mass-flow boundary conditions at the engine inlet and actuator-based exhaust models for jet exhaust allows you to set up a realistic aero-propulsive environment that correctly models the fluid flow.



MODELING PROPELLERS

Model propellers in steady flow using propeller actuator discs. These actuator discs allow for the evaluation of volumetric effects of the propeller momentum, at no reduction in solver speed and agility. Designed to be computationally complimentary, you can add as many propeller actuators as your airplane needs. Cascade the actuators to simulate contra-rotating effects. Place them in any orientation, size, or coordinate system. All you need is the thrust, power, diameter, and RPM.



INTEGRATED AEROACOUSTICS

THE FLIGHTSTREAM[®] ONE-CLICK ACOUSTICS TOOLBOX FOR URBAN AIR MOBILITY VEHICLES

FlightStream[®] has a fully-integrated aeroacoustics toolbox implemented under a NASA-funded STTR activity. This toolbox is capable of modeling both tonal and broadband noise components of UAM propellers, rotors and flexible structures. FlightStream exports all FAA vehicle certification acoustic data at a click of a button!



UNSTEADY VORTICITY SOLVER

Want to investigate the time-based aero-propulsive effects? No problem. Use our FlightStream[®] unsteady vorticity solver. You can create motion types and attach them to surfaces on your geometry. Use these to simulate propeller rotation and evaluate the time-dependent effects on the wing as well as the propeller blades! Since the flow solver works on a surface mesh, no advanced volumetric modeling is required from the user, but volumetric effects at any point in space around the geometry can still be evaluated using our post-processing tools!



FLIGHTSTREAM IS A TEAM PLAYER

	IMPORT GEOMETRY	EXPORT SOLUTION
CAD/CAE (NX, SOLIDWORKS, CATIA, SOLIDEDGE, AUTOCAD)		
ANSA, CADENCE POINTWISE [®]		
NASA OpenVSP		
TECPLOT 360 / TECPLOT 10 / TECPLOT CHORUS		
PARAVIEW		
ABAQUS, MSC NASTRAN, HYPERWORKS F.E.A.		
ANSYS PHOENIX MODELCENTER		
USER-DEFINED CUSTOM GEOMETRY		

ROTATING REFERENCE FRAME SOLVER

The Rotating Reference Frame Solver mode is a simple setup that allows you to model your propeller/rotor geometries in steady flow axisymmetric conditions. Analysis options allow for computation of thrust, torque, power, and efficiencies versus advance ratios and more!



BOUNDARY LAYER INGESTION

FlightStream[®] has a fully viscous-coupled non-linear flow solver that allows the accurate physics-based capture of boundary layer flow and its impact on the vehicle aerodynamics. Combined with advanced viscous velocity profiles in pre-, at- and post-separation regimes, an accurate viscous velocity map can be generated on fluid volume sections in front of propulsors on BLI-configured aircraft. Given computation times measured in seconds, this is a key enabler for early-design BLI analysis!



POST-PROCESSING & DATA ANALYSIS THE ALL-IN-ONE AERODYNAMICS TOOLBOX.

- Comprehensive UI & automated workflows
- Interactive CAD, meshing and repair tools
- Extensive scripting and batch submission API
- Solver-integrated graphics
- Integrated post-processing tools
- Sectional loads & moments for each component
- Plot on-body and off-body streamlines
- Sectional planes show volume slices of fluid flow
- Point-cloud flow data extraction
- Pressure field export for FEA integration
- Surface flow cross-sections



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