RELEASE NOTES

Altair FlightStream 25.0

New Features and Enhancements 25.0

Altair **FlightStream 25.0** includes the following new features and enhancements.

Full Release Notes

Added

- Aeroelastic Toolbox is new for for fluid-structure interaction problems.
- Flux-based integral boundary layer flow solver is added.
- The ability to duplicate Volume Controls is included.
- Ability to select and reorder multiple Drawing Curves is added.
- In SCT, when running a half model with lateral derivatives, lateral coefficients are not computed and their values are set to zero.
- New scripting function SET_BASE_REGION_CP is added.
- Included the ability to cut mesh components via the right-click context menu.
- Improvements to post-processing for low order supersonic solver are included.
- Feature to create cross sections directly from CAD IGS surfaces is added.
- Turbulent Trip Edges now visually appear as yellow in Mesh scene.

Changed

- CAD Interface is completely redesigned with improved importing of CAD surfaces and improved repair capabilities.
- CAD > Transform curves now gives the option to "Keep Original" curve.
- The User Manual documentation is much improved with a focus on various applications.
- Renamed "Topology" to "Diagnostics".
- Moved commonly used toolbar buttons to more intuitive locations.
- Warnings now output to log window for unknown scripting commands.
- Renamed "proximity" to "Wall collision avoidance" in the wake settings dialog box for clarity.
- Updated tooltip text for the proximity button to: "Specify boundary pairs for proximity detection (used for gapped control surfaces only)."
- Improved button icon images for better visual representation.
- Solver statistics now show total faces used in solver after quads agglomeration step.
- Sped up of Volume Section generation by allowing use of multiple cores.
- MeshU value for CCS lifting surfaces defaults to 100 nodes with 1.1 growth rate.
- Added additional parameters to OPEN_SIMULATION for resetting core count and loading solver initialization (now matches GUI dialog).
- Statistics Tab now shows the agglomerated faces when in the Solver scene.
- Improved Units description on SCT. Now shows s/degree or s/radian for dynamic derivatives.
- Velocity Residual now held constant during Viscous-coupled solver cycle to better match the convergence checks in the code.
- Changed scripting usage for CREATE_NEW_INLET.
- Changed script command SOLVER_PARALLEL_CORES to SET_MAX_PARALLEL_THREADS.
- Renamed "Solver" tab in bottom left pane to "Runtime".
- "Force solver to run all iterations" checkbox removed and merged with "Number of iterations" with a checkbox.
- CAD "Aligned Mesher" renamed to "Quad Mesher".
- "Sectional forces" plot name changed to "force distributions" to remove confusion with 2D sectional forces.
- Post processing>Sectional Loads are now "updated" rather than "generated".

- Included new Altair splash image and About window image.

Removed

- Vector specification for Inlets. Only normal velocity allowed now.
- Jet Exhaust actuator disc model. Will be replaced in a future version.

Release Highlights

This is the 25.0 official release of FlightStream under the Altair product suite. This release brings an improved CAD workflow and several new features including the Static Aeroelastic Toolbox, the Low Order Super- and Hypersonic solvers, as well as the High Order Supersonic Solver.

CAD Workflow Resdesign

To improve the user experience in CAD clean up and repair and for CCS creation, the CAD>Create panel has been significantly improved. The buttons are more intuitive and new buttons have been added.
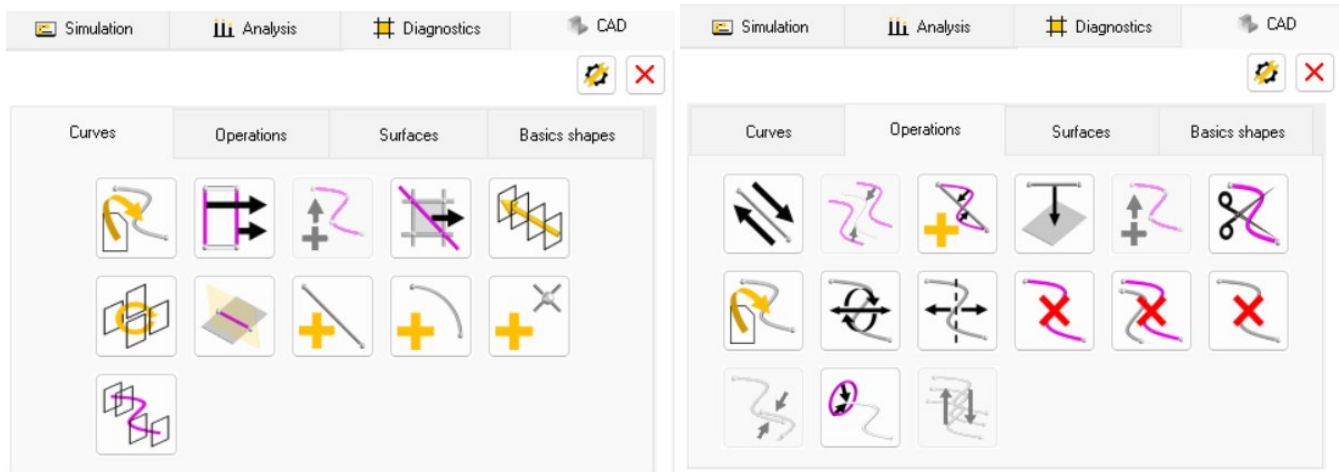
Additionally, the CAD>Repair panel has been improved.
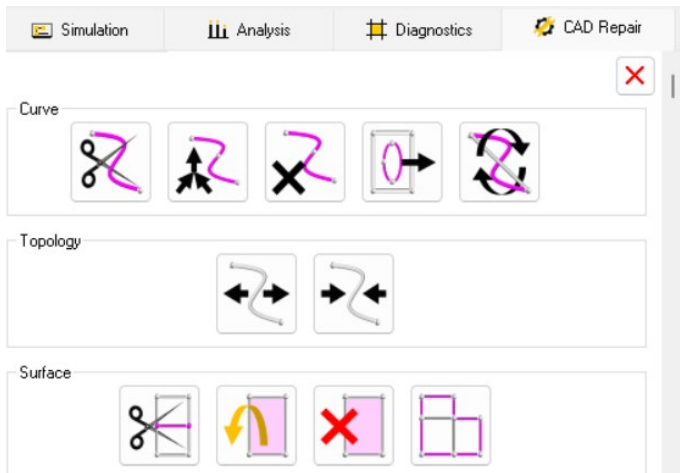
Low Order Supersonic (LOSS) & Low Order Hypersonic Solvers (LOHS)

The low order supersonic and hypersonic solver utilize surface inclination to calculate the surface pressure on the geometry. The LOSS is based on tangent-cone methodology. The LOHS is based on Modified-Newtonian impact theory. These methods are meant to be used on geometries where component-component interactions are minimal. These solvers run almost instantaneously. Additional documentation sections have been created in the User Manual to support these. These models can be accessed in the Solver Initialization dialog. Neither solver currently resolves thermal heating effects.

High Order Supersonic Solver (HOSS)

The HOSS solves the full Prandtl-Glauert compressibility equations. This allows for accurate capturing of full volumetric shocks and component-component shock interactions. This solver is slower to run the LOSS but increases the solution fidelity.

Static Aeroelastic Toolbox (SAT)

The SAT allows users to simulate the effects of flexible structures. By coupling the FlightStream solution with an external structural solver, FlightStream's solid body morphing routine apply the structural deformations to the aerodynamic body. Validation cases and sample workflow scripts are available upon request.