Ansys

Ansys + Innoveering

"Ansys solutions obtained through the Ansys Startup Program allowed us to achieve meaningful results for complex, high-speed flows in harsh environments that would have otherwise been difficult or impossible to generate. Ansys provides an effective path towards achieving our goals in a timely manner with accurate, meaningful results, making us more reliable and competitive in our field."

Dean Modroukas
Principal / Innoveering / Ronkonkoma, NY

Experimentation with aircraft in harsh environmental conditions can be difficult and expensive. The cost of materials, manufacturing limitations, physical limitations (size/temperature) and data gathering limitations are all issues that can be bypassed through the use of engineering simulation.

Simulating High Speed Flow

/ Company Description

Innoveering is a six-year-old startup supporting the aerospace, defense and energy marketplaces. Our company's heritage is in harsh environment physics, including harsh environment sensing and controls. We are a nimble, quick-acting organization capable of addressing challenges with innovative solutions using novel sensing and control techniques. Our company has expertise that ranges from idea generation, to prototype design, to computational analysis, to final product testing and field trials.
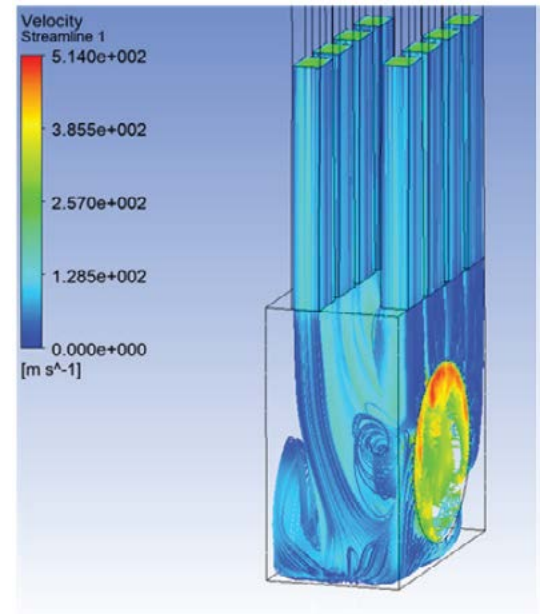
/ Challenges

Gathering experimental data in supersonic/hypersonic conditions can be challenging. Designers and manufacturers need to ensure the structural integrity and safety of their products in high-stress situations while optimizing the flow of air around the aircraft. Numerical simulations can generate data that would be difficult or impossible to gather otherwise. Simulations must accurately represent complex flows and allow for continuous gathering of data to compare to, and eventually supplement, experimental data.

/ Technology Used

- Ansys Workbench
- Ansys SpaceClaim
- Ansys Fluent
- Ansys CFD-Post

Velocity streamlines from CFD simulation to verify experimental results for the volume flow through bleed holes.

/ Engineering Solution

Ansys Workbench enabled engineers to easily vary geometry and flow conditions to optimize aircraft performance in supersonic/hypersonic conditions. Ansys Fluent allowed engineers to observe and solve complicated flows without any physical constraints such as size, material cost, manufacturing limitations, sensor survivability, etc. The simulation software accurately solved for supersonic flows with complexities such as vortex shedding, shock generation/reflection, etc. Once anchored, the CFD model was used to run parametric studies and generate data to supplement physical testing.

/ Benefits

Engineering simulation, specifically CFD, is a robust method for gathering data. It has several advantages compared to physical testing:

- Cost savings of up to 50% (reduced material/manufacturing and test facility costs).

- Easy, reliable data gathering through continuous monitoring of solutions.

- Ability to easily simulate changes in parameters.

- Visualization of properties that would otherwise be impossible.

Ansys Workbench allowed engineers to generate meaningful results for complex problems and verify experimental results, making Innoveering solutions reliable and competitive in the field of supersonic/hypersonic aircraft.
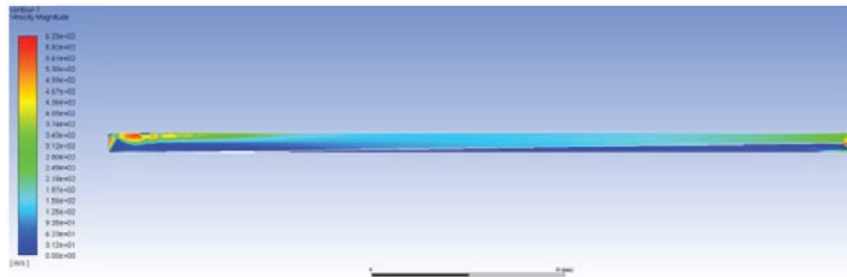
Velocity contour from CFD simulation to determine the force on a deflecting beam in a flowing environment.

If you've ever seen a rocket launch, flown on an airplane, driven a car, used a computer, touched a mobile device, crossed a bridge or put on wearable technology, chances are you've used a product where Ansys software played a critical role in its creation. Ansys is the global leader in engineering simulation. We help the world's most innovative companies deliver radically better products to their customers. By offering the best and broadest portfolio of engineering simulation software, we help them solve the most complex design challenges and engineer products limited only by imagination.

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