

Invitation to the evening lecture

“Aerodynamic Analysis of the NASA Source Diagnostic Test Configuration”

FH JOANNEUM Graz – Alte Poststraße 149 / Lecture Hall 212, 8020 Graz

Wednesday, 12th March 2025 / 5:00 PM

Speakers:

Mario Rammelmüller, Master’s student in Aviation at FH JOANNEUM and intern at AVL

Alexander Machold, Skill team leader of the Multiphysics CFD Simulation department at AVL

Abstract of the presentation: (Mario Rammelmüller)

The aim of this presentation is to showcase my activities during my internship at AVL List GmbH in the field of Computational Fluid Dynamics (CFD). The NASA Source Diagnostic Test (SDT) represents the bypass duct of a modern high bypass ratio aircraft engine and is often used for the validation of new CFD approaches as it offers a rich experimental database. This reference case was specifically chosen for my work at AVL as it also provides experimental acoustic data. This is necessary, because the goal of my work in my subsequent master’s thesis is to analyze the aeroacoustic emissions of the NASA SDT configuration, to verify the novel workflow.

Therefore, during my internship, I developed and set up steady (RANS) and unsteady (PANS) CFD models, to determine the noise source terms, which are related to the pressure fluctuations due to the rotor-stator interaction. Practical considerations for setting up the model based on the underlying theory, as well as the results of my analysis, will be shown. In the second part of the presentation, the skill team leader of my department “Multiphysics CFD Simulation”, DI Alexander Machold, will talk about the various activities and projects that are conducted in the department, as well as the company AVL as a whole.

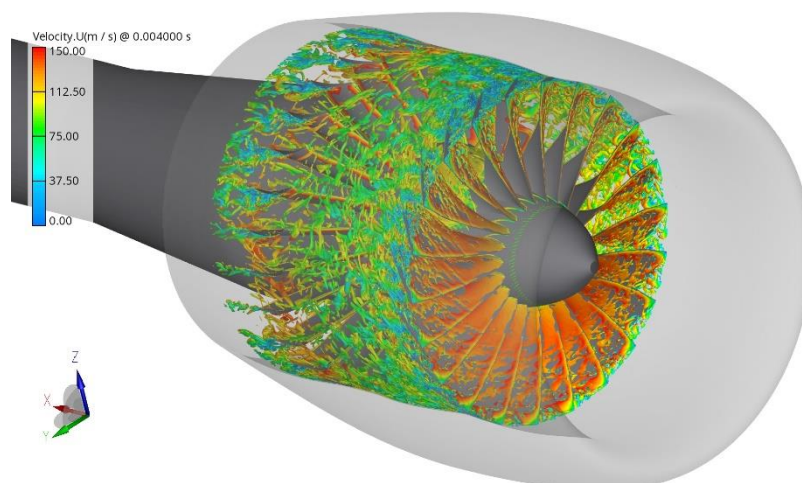


Figure 1: Axial velocity colored Q-criterion ISO surfaces inside of the NASA SDT configuration, visualized in AVL IMPRESS™ M.