

Call for Applications Master's / Bachelor's Thesis

Reactive CFD Combustor Simulation for Emissions Analysis of Aircraft Engines Using SAF

As part of the European *Horizon Europe* research project “INDIGO”, the *Chair of Thermal Turbomachinery and Aeroengines* is conducting reactive combustion chamber simulations for the use of Sustainable Aviation Fuels (SAF). The goal of this work is the development of Reduced-Order Models (ROMs) that enable time-efficient calculations of performance and emission characteristics of combustion chambers. These ROMs are used, for example, in the context of engine design and performance analysis by coupling them with corresponding 1D system models.

The objective of the advertised thesis is to develop a 3D CFD model of an aircraft engine combustor and to perform reactive flow simulations to determine the emissions profile. The simulation results will serve as a basis for the development of reduced-order models, which also includes the creation of a suitable post-processing routine. A combustor geometry and extensive expertise in numerical combustion chamber simulation are available at the chair.

The scientific documentation can be written in either German or English.

This thesis is aimed at students interested in numerical flow simulation in the context of aerospace applications. The following qualifications are desirable:

- Experience in setting up (pre-processing) and conducting CFD simulations, ideally using ANSYS Fluent and/or OpenFOAM
- Basic knowledge in turbomachinery, aircraft engines, and ideally numerical methods
- Programming skills
- Independent and structured working style

Applications to:

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