

Implementation and Validation of a Large Eddy Simulation Model in the high-fidelity CFD-Code DINO



Project description

Large-Eddy Simulation (LES) has become a key tool for the simulation of turbulent flows in both academia and industry. By resolving the large, energy-containing turbulent structures while modeling only the smallest scales of motion, LES provides an accurate representation of the dominant flow dynamics. Compared to Direct Numerical Simulation (DNS), which resolves all turbulent scales, LES achieves a favorable balance between predictive accuracy and computational cost, making it applicable to complex engineering flows that remain beyond the reach of DNS. As a result, LES has become an essential approach for the investigation of turbulent and reacting flows in modern computational fluid dynamics.

Project aims

This master thesis involves the selection of a suitable model, its integration into the existing code framework, followed by verification and validation studies on representative test cases. The resulting capability will enable high-fidelity simulations of turbulent processes and contribute to the further development of DINO for research on future low-emission combustion systems.

About You

This thesis could be a perfect fit if you:

- ❖ Are interested in turbulent flows, CFD and turbulence modeling
- ❖ Are motivated to extend your knowledge and learn something new everyday

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Topic Suitable for

Student Project

Bachelor Thesis

Master Thesis



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