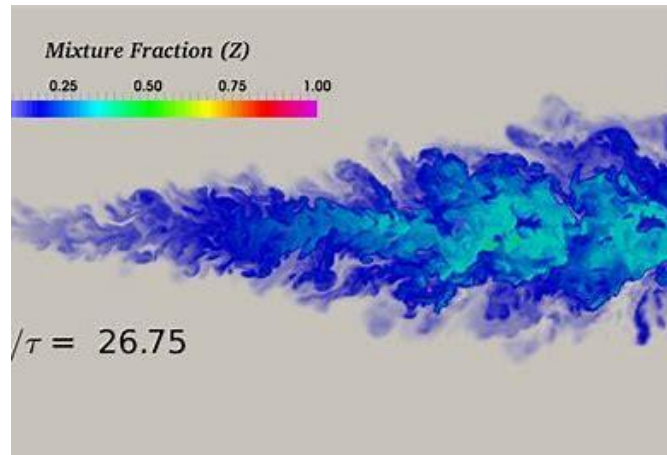# Masterthesis

Collaborative research project between

ITLR – Stuttgart University & the University of California, Davis

The photo is of a heated jet discharged into stagnant surroundings.

This is an important flow to study due to its frequent occurrence in the natural environment and in engineering applications.

There is much interest in being able to accurately predict the growth of the heated jet, and the rate at which the temperature changes as the jet develops downstream of the exit.

This project is concerned with evaluating the ability of different models of turbulence (for both the Reynolds stresses and the turbulent heat fluxes) to predict this flow. Experimental data for both free and wall-bounded heated flows are available to compare with to arrive at solid conclusions.

The research will be performed at the University of California, Davis, and I will be supervised jointly by Professor Bernhard Weigand (Bernhard.weigand@itlr.uni-stuttgart.de) and Professor Bassam Younis (bayounis@ucdavis.edu) from whom further details may be obtained.

The computations will be performed using in-house, open-source computer software for which training will be provided.

Tasks

1. Literature survey.
2. Familiarization with the in-house computer software and with the turbulence models.
3. Implementation of additional models to supplement the ones already implemented.
4. Simulation of two-dimensional heated turbulent jets.
5. Comparisons with experimental data.
6. Analysis of results.
7. Preparation of diploma thesis.