



Masterarbeit Nr.: LSS-M??/??

Aufgabenstellung für die Masterarbeit von: ??

TITLE: Optimizing the predictions obtained with the k- ω SST turbulence model for practical turbulent flows

SHORT DESCRIPTION:

Most industrially relevant simulations of turbulent flows still rely on classical, two-equation turbulence models in the framework of the Reynolds-Averaged Navier-Stokes equations (RANS). Though the underlying model parameters have been manually optimized during many years, there is still potential for identifying more accurate parameters with a high level of generality, delivering faithful predictions for a variety of relevant flows. This has already been demonstrated in our group for the well-known “k- ϵ ” model family (Medeiros de Souza et al., „Multi-objective optimisation of the model parameters for the realizable k - ϵ turbulence model“. Progress in CFD, in press); a similar work must now be carried out for the more recent and very popular k- ω SST model during this Master’s Thesis.

Major steps:

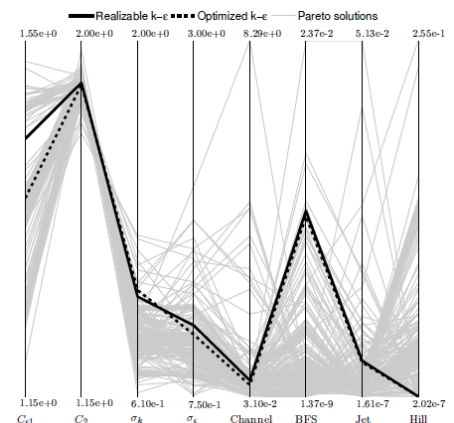
- Get acquainted with the subject by analyzing the cited article
- Analyze in detail the k- ω SST model and the underlying hypotheses, in order to identify appropriate free parameters and parameter ranges
- Become familiar with the OPAL++ optimization library developed by Dr. Dárczy, which will be used for parameter optimization
- Run all cases with an appropriate CFD tool
- Analyze the results
- Prepare a corresponding publication with the supervisors

Pre-requisites:

- Good knowledge of Fluid Dynamics
- Practical experience of Computational Fluid Dynamics

Supervision:

- Dr.-Ing. László Daróczy (ISUT/LSS)
- Dr.-Ing. Luís Medeiros de Souza (ISUT/LSS)



Beginning: as soon as possible