HiWi / Bachelor / Master Thesis

Improvement of G-equation Model in RANS for Premixed Turbulent Flame

In a wide variety of technical applications turbulent premixed combustion processes occur in the so-called flamelet regime. This regime is characterized by reaction zone thicknesses that are smaller than the Kolmogorov length scale. In this regime, a flamelet model based on an equation describing the dynamics of a laminar flame front, known as the G-equation, has been developed. The model has been employed in conjunction with a RANS turbulence model in different practical applications.

In this study we will investigate the G-Equation model in the context of RANS. The RANS models should be assessed in an a posteriori way, comparing with the already available experimental and numerical data. We will focus on the averaging of the G-equation in the RANS context. A simplified configuration is chosen: a jet flame, for which measurements and numerical simulations under different conditions are already available. The combination with a HiWi-job is also possible.

**Tasks**
- RANS simulation of the jet flame in CIAO
- Assessment of the premixed combustion models in RANS
- Analysis of the influence of model parameters

**Requirements**
- Interest in programming
- Experience with Linux desirable
- Self-motivation & commitment

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