

Experimental Research on Turbulent Spray Combustion under Gas Turbine like Conditions

Motivation

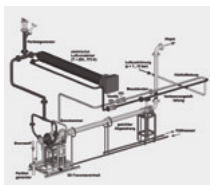
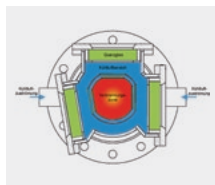
- Investigation of spray combustion under gas turbine related boundary conditions
- Characterisation of two phase flows and droplet-turbulence interaction

Method and Theory

Non-intrusive laser measurements techniques: LDA/PDA, Tracer- and OH-PLIF, IPI, PIV, Mie-Scattering, CARS, thermographic phosphors

Test Facility

- modular assembled gas turbine model chamber
- $p_{ch} \leq 10$ bar, $T_{comb, air} \leq 770$ K
- decoupling of thermal- and mechanical strain
- optically accessible combustion chamber



Measurement

- Airblast-Atomizer (MTU)
- different spray media (water, n-heptane)
- one- and two-phase-, reacting- and non-reacting-flows
- Measurements inside the Airblast Atomizer

Investigation of

- local velocity fields and corresponding fluctuations
- spray droplet size distribution
- spray mixing, spray vaporisation, spray penetration

