Professur für Regenerative Energiesysteme
Campus Straubing für Biotechnologie und Nachhaltigkeit
Technische Universität München

Master Thesis **February 9th, 2026**

Investigating gas mixing quality of different nozzle geomtries by LIF (Laser Induced fluorescence) for the optimization of secondary combustion chambers in biomass combustion plants

Description

Laser Induced Fluorescence Measurements of different nozzle geometries to optimize the mixing process in a secondary combustion zone of a biomass combustion plant needs to be done. The LIF-System consists of a UV-Laser and a camera and will be used to investigate the mixing of gas streams. One gas stream is infused with acetone and its fluorescence will be activated by the UV Laser. The captured images will then be analyzed to find concentration fields and statistical target parameters to identify optimum nozzle geometries. The thesis can build up on existing measurement data, continue the experiments and deepen the understanding of gas mixing in secondary combustion chamber of biomass combustion plants.

Figure 1: Long axis agitator

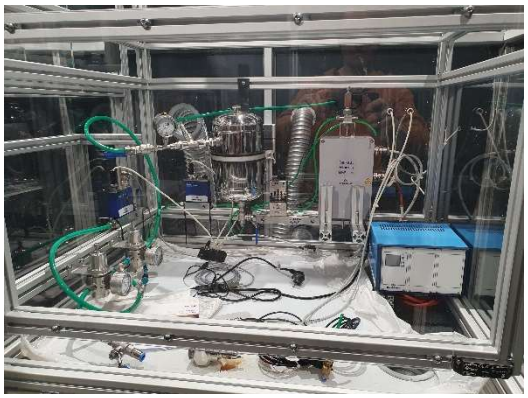

Figure 2: CFD Simulation Long axis agitator

Tasks

- Literature research
- Solid works design of optimized nozzle geometries
- Mounting the designed components
- Checking all the System Components
- Operating of the trial facility

Requirements

- Solid works
- Fluid mechanics
- Mechanical engineering with a practical orientation
- Hands on mentality

If you think you are the right candidate to solve this task, please contact me.
Desired starting date for the master thesis is March 1st, 2026.

I am looking forward to get to know you.

Contact

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