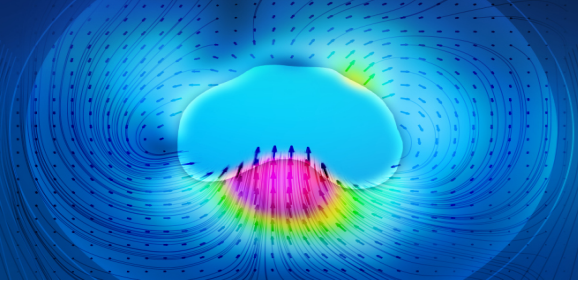
TUHH Hamburg University of Technology

Institute of Process Imaging



HiWi Student

Particle drying

Motivation:
Gas-solid fluidized beds are extensively used in various applications within process engineering. The increased gas-solid contact in fluidized beds facilitates high heat and mass transfer rates. Fluidization phenomena strongly depend on particle characteristics, bed dimensions, operating gas velocities, and gas distribution.

Tomographic techniques such as electrical capacitance tomography, X-ray computed tomography, and MRI have been employed to characterize three-dimensional fluidized beds [1]. In our institute, we work MRI to investigate fluidized bed hydrodynamics.

To obtain an MRI signal from the fluidized bed particles, the particles must be NMR active. For instance, the material can be designed as a shell-core structure, where the core is filled with an NMR-visible component such as oil or water. Alternatively, if the particles have open pores, these pores can be filled with NMR-visible components.

In this study, powder with open pores will be soaked in water and subsequently dried for MRI experiments involving fluidized beds.

Tasks:
- Particle drying
- Determination of NMR properties of particles with a benchtop NMR spectrometer

Your profile:
- Ideally, prior laboratory work experience.

Starting date: January / February 2024

Duration of the contract: 3 months / 20 hours per month

Contact person: Melis Özdemir, melis.oezdemir@tuhh.de, Tel: +49 40 42878 3124, Building L, Room 3014

References: [1] Wang, A.; Marashdeh, Q.; Teixeira, F. L.; Fan, L.-S. Applications of Capacitance Tomography in Gas–Solid Fluidized Bed Systems. In Industrial Tomography; Elsevier, 2015; pp 529–549.