Bachelor-/Master-/ Semesterarbeit:

Simulation with MATLAB: Magnetic separation at pilot scale

Keywords: Modelling, Simulation, Downstream Processing, Process Development, MATLAB

Project description

- From Modelling & Simulation to Digital Twins -

Magnetic separation is an innovative technology for purifying various valuable substances from, for example, fermentation broths. In the future, this novel process should represent a more cost-effective alternative to chromatography. A prerequisite for this is optimized process control. The solely experimental investigation, however, is costly and requires a lot of time. In this context, mathematical models are important tools that can be used to investigate separation mechanisms.

In this work, mechanistic/physical models will be derived that simulate the physical mechanisms of magnetic separation. On the one hand, this should make physical effects that are difficult or impossible to measure accessible, and on the other hand, the models be applied in digital twins for process optimization. Finally, the models will be validated through specific experimental data.

Tasks

- Derive mechanistic models
- Simulation in MATLAB or Python
- Validation with experimental data
- Integration into process control

Requirements

- Structured workflow
- Great interest in novel technologies
- Advantageous: knowledge in the fields of: modelling, simulation, MATLAB, python, etc.

Experiment vs. Simulation
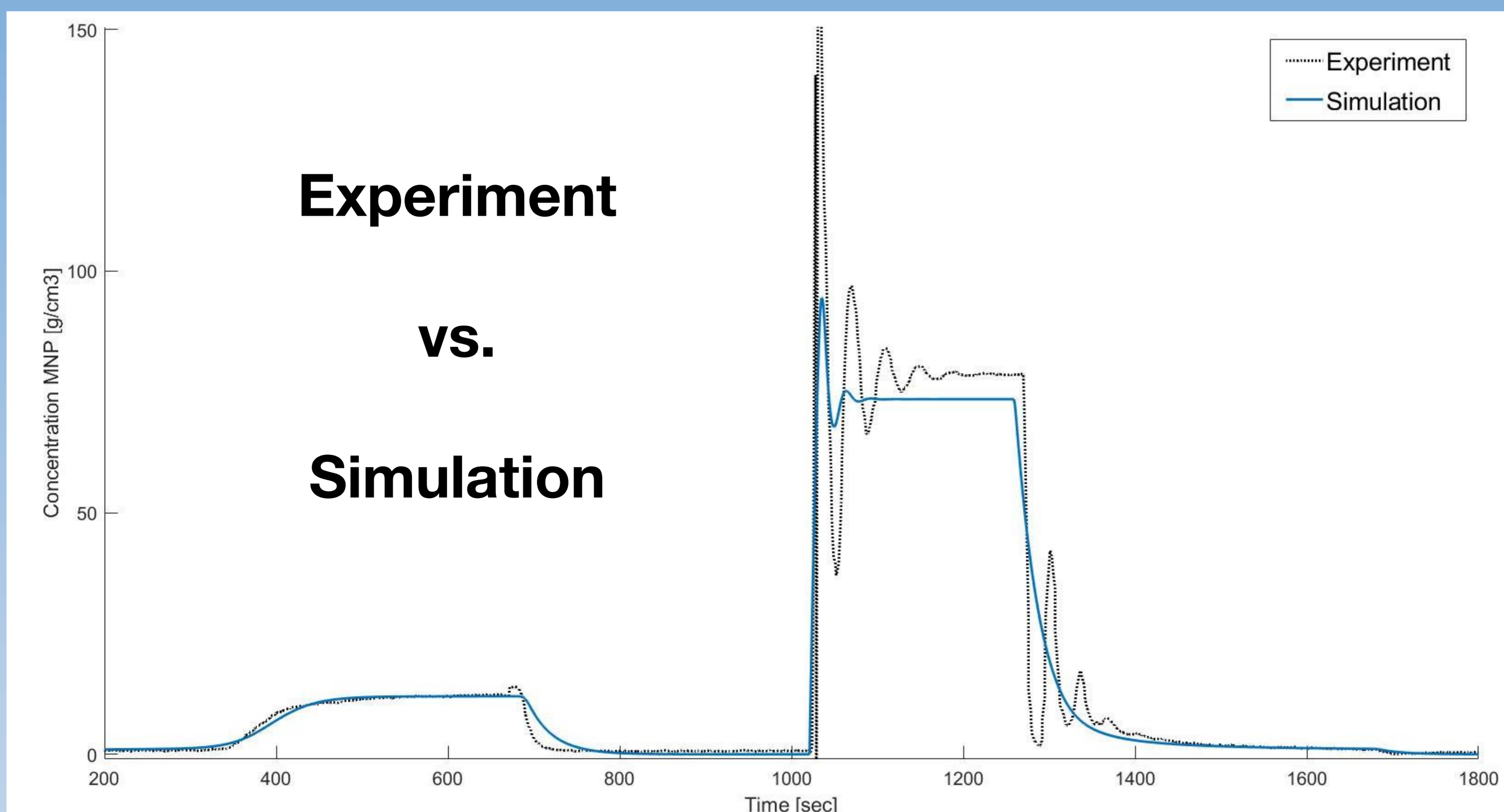
Contact

Marko Tesanovic
m.tesanovic@tum.de