Chair of Bioseparation Engineering
TUM School of Engineering and Design
Technical University of Munich

BioSE

Bachelor's/ Master's/ Semester Thesis

Development of a Continuous and Scalable Magnetic Separation Process

Project Description

Magnetic separation is a pivotal technology for purifying valuable substances, such as proteins, enzymes, and antibodies, from complex mixtures. Traditional batch and semi-batch processes, while effective, face limitations in throughput and especially scalability. This project aims to develop a continuous magnetic separation process that addresses these limitations, offering a cost-effective alternative to existing methods. This research will involve designing a continuous magnetic separator, optimizing the plant design, and ensuring scalability. Utilizing computational models and simulations, we will refine the separator design to enhance separation efficiency and throughput.

Objectives:

(i) Design and simulate a continuous magnetic separator
(ii) Optimize magnetic field configuration and flow dynamics
(iii) Evaluate the theoretical scalability of the prototype
(iv) Validate the system through computational and experimental data

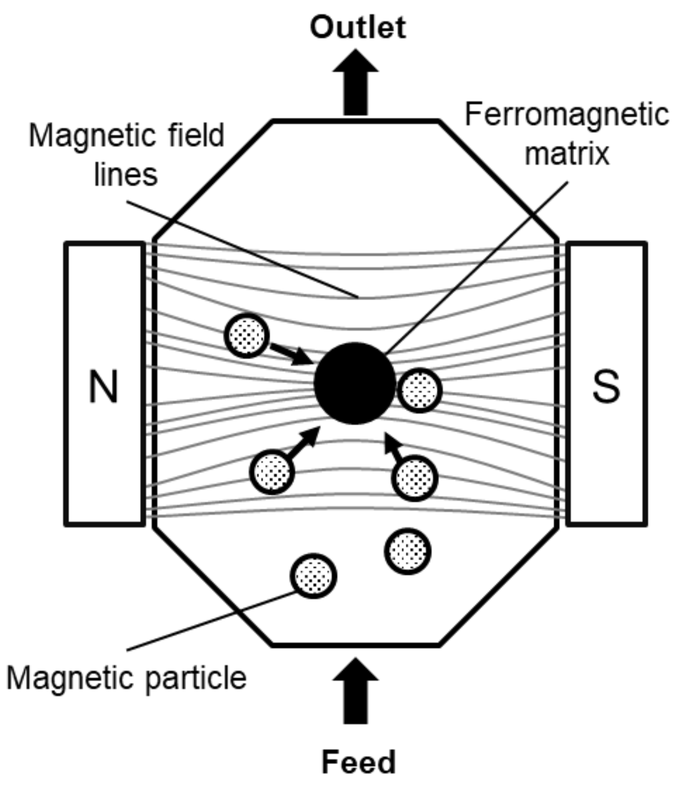
Profile

- Bachelor or master student in engineering, physics, or related studies
- Structured and independent work
- Motivation to work as a team
- **Start date**: flexible

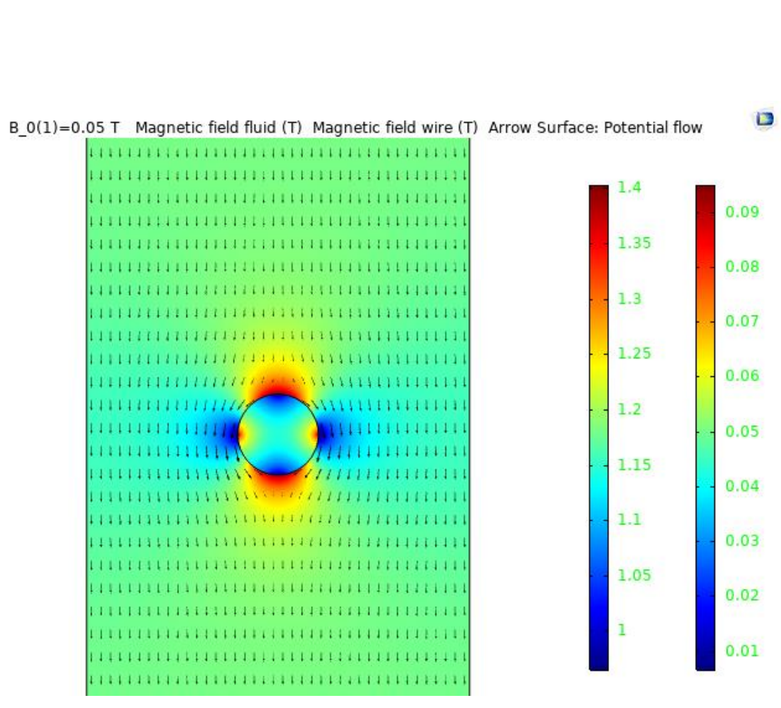
Tasks

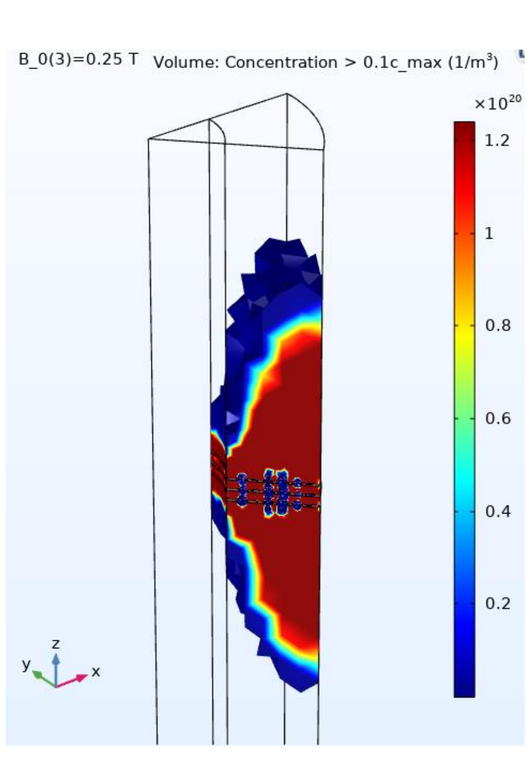
1. Develop conceptual designs
2. Simulate the process and conceptual designs
3. Prototype development
4. Theoretical Scale-Up Evaluation

HGMS Principle



COMSOL Outputs





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