Design and Simulation of an Evaporator Test Bench

Type: Bachelor / Semester Thesis / Master Thesis
Content: theoretical / experimental / simulative
Possible start: April

TUM Hyperloop

Our group is researching Hyperloop technology for passenger transport. We focus on electromagnetic levitation, suspension, and propulsion, simulation of high-speed aerodynamic phenomena, cooling systems, and vehicle structure and infrastructure topics. Depending on the topic, we work on new test benches and the implementation of various experiments, computationally intensive simulations, or the design of new types of components. Our chair aims to motivate you and other students to develop modern technology for tomorrow – together as a strong team with the power of everyone.

Job Description

Designing an efficient cooling system under near-vacuum conditions is essential for Hyperloop transportation. In this project, an evaporator-condenser setup will be developed and analysed. The student will design both components using a CAD tool (e.g. SolidWorks) and simulate flow and thermal behaviour with ANSYS. The goal is to reproduce the same behavior observed in the small-scale experiments and to develop 2D, and potentially 3D, simulations to evaluate the flow path.

Your Tasks

- Understanding the basic principles of TES and evaporator cooling.
- Create the model for the actual test bench using design software (e.g. SolidWorks).
- Conduct complex multi-phase simulations in thermal and CFD software.

Our Requirements

- Experienced knowledge of thermodynamics and fluid mechanics.
- Experience with design and CFD software (e.g. ANSYS).
- High motivation with enthusiasm to make an impact.

Our Offer

- Working with students and researchers in a highly motivated young research team.
- Experience in a new field of research which is gaining in importance.
- Possibility to be involved in the experimental set up assembly.

Contact

If you are interested in working in our team, please send your CV, motivational letter and supporting documentation to Miriam Hernan Gomez (miriam.hernan-gomez-mingo@tum.de). If you have any questions, do not hesitate to contact us.