TUM Hyperloop
TUM School of Engineering and Design
Technical University of Munich

Cryostat Design for the TUM Hyperloop Demonstrator

Type: Master Thesis
Content: experimental / CAD
Possible start: 07.10.2025
Key words: cryostat design, technical drawings, thermal simulations, test stand

TUM Hyperloop

Our group is researching Hyperloop technology for passenger transport. We focus on electromagnetic levitation, suspension, and propulsion, as well as the simulation of high-speed aerodynamic phenomena, cooling systems, and topics related to vehicle structure and infrastructure. Depending on the topic, we develop new test benches and implement various experiments, computationally intensive simulations, or design 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

In this thesis, you will take ownership of an experimental project: designing and realizing a cryostat made from stainless steel or carbon-fiber-reinforced polymers, mounted on a vehicle operating within the TUM Hyperloop Demonstrator tube. Your tasks include designing and assembling the vehicle, performing thermal simulations in Ansys to optimize the cryostat design, and integrating the cryostat along with its subcomponents into the vehicle. In the final stage, high-temperature superconducting coils cooled by liquid nitrogen will be installed and tested as part of the hyperloop's propulsion system.

Your Tasks

- Conduct thermal simulations in Ansys.
- Design a vehicle and cryostat with CAD.
- Talk and negotiate with potential suppliers.
- Assemble the test bench and work with liquid nitrogen.

Our Requirements

- Passion for working experimentally, no fear of cryogenic liquids, and trying new things.
- At least medium-sized experience with finite element software and/or CAD.
- English and German language skills for communication with suppliers.
- Perseverance to finish tasks with high reliability and on time.
- Experience with electronics is a plus.

Our Offer

- Working with students and researchers in a highly motivated young research team.
- Experience in a new field of research that is gaining importance.

Contact

If you are interested in working with our team, please send your application, motivational letter, and supporting documentation to Tim Hofmann (tim.hofmann@tum.de). If you have any questions, do not hesitate to contact us.