
Prof. Alexandre Obertelli
Institut für Kernphysik, Fachbereich 05 Physik
Schlossgartenstraße 9, 64289 Darmstadt
aobertelli@ikp.tu-darmstadt.de



TECHNISCHE
UNIVERSITÄT
DARMSTADT

Master Thesis in Nuclear Physics

Development of a thick liquid hydrogen target for hypernuclei experiment at GSI/R³B

A Master thesis is open in the group of Prof. Alexandre Obertelli at the Institut für Kernphysik (IKP) of TU Darmstadt.

Studies of hypernuclei which carry a new strangeness quantum number, shed a new light on the world of traditional nuclei by revealing new symmetries and new phenomena. So far only about 40 hypernuclei have been synthesized and studied using pion, kaon or electron beams by the missing mass spectroscopy. As first pioneered by the HypHI collaboration at GSI, heavy-ion beams induced reactions offer new opportunity to produce and study exotic (proton-rich or neutron-rich) hypernuclei by the invariant mass spectroscopy. We are starting a program at GSI/R³B to study hypernuclei production via high-intensity heavy-ion beam bombarding a thick hydrogen target. The master student will participate to the target development in Prof. Alexandre Obertelli's group and will focus on the control-command system and building a long target cell for the hypernuclei experiment. The liquid hydrogen target is driven by the so-called thermosiphon mechanism. The master student will work on the thermosiphon simulation to guide the design of the liquid hydrogen circulation between the coldhead and the target cell.

His/Her task will focus on

- 1) Develop the control-command system to control the cryogenics, temperature and pressure probes and valves
- 2) Build the target cell
- 3) Investigate the key parameters in the thermosiphon circulation via simulation

Candidate profile:

Only candidates holding a Bachelor degree in physics or engineering will be considered. The ideal candidate speaks English fluently and have strong practical ability.

Contact:

The information on this sheet will possibly be updated. Interested candidates should directly contact Prof. Alexandre Obertelli via e-mail (aobertelli@ikp.tu-darmstadt.de).