

ACCELERATOR SEMINAR

Alexandre Obertelli

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Thursday, 3rd May at 4 p.m.

Lecture hall, south building

Planckstraße 1, 64291 Darmstadt

"Towards the driplines: projects with radioactive nuclei at CERN and FAIR based on cryogenic techniques"

Neutron-rich nuclear systems reveal particular phenomena such as shell evolution, halos and neutron skins. Large efforts are being made worldwide to reach the most neutron-rich nuclei and investigate how their structure differ from stable ones, leading to stringent tests for the predictive power of state-of-the-art nuclear structure models. In this seminar, two projects dedicated to the study of radioactive nuclei will be introduced. Both contain a significant cryogenics component. Thick liquid hydrogen targets are believed to be an important asset for the NUSTAR physics program at GSI/FAIR. A review of existing targets will be shown. New programs considered for NUSTAR and requiring H₂ target developments will be introduced. The use of low-energy antiprotons to study short-lived nuclei is at the heart of the PUMA project to be developed at CERN. An important aspect of the project is the long storage of trapped antiprotons in a sealed Penning trap at 4 Kelvin. The technical challenges related to low temperatures will be overview. PUMA may open opportunities with low-energy antiprotons at FAIR.



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