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Commissioning and First Storage Ring Experiments of the Transverse Free-Electron Target

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A BMBF-funded free-electron target for GSI's/FAIR's storage rings that operates in transverse collision geometry, i.e., with an interaction angle of 90◦ between electrons and stored ions, is presently being built up and tested at the University of Giessen. The target is intended as a user facility for electron-ion collision experiments and x-ray spectroscopy with free electrons. Originally, it was intended to install and commission the target in 2021 and 2022, respetectively. Due to a long list of unforeseeable events (Corona, quality problems with vacuum equipment, late or canceled delivery of components, manpower due late start of BMBF funding) the commissioning in 2022 had to be postponed.
In this proposal we ask for beamtime for commissioning of the electron target, of the experimental spectroscopy set-up at the CRYRING and for first x-ray experiments with highly charged ions. The commissioning is planned in 2 phases: In the initial general commissioning phase, ions from the local injector will be used (e.g. H-like/He-like oxygen; ECR source). In the second phase, a first x-ray experiment with highly charged ions (H-like, He-like; Z>54) from the ESR is envisaged.

Hauptautor: BRANDAU, Carsten (GSI Helmholtzzentrum für Schwerionenforschung GmbH(GSI))

Vortragende(r): BRANDAU, Carsten (GSI Helmholtzzentrum für Schwerionenforschung GmbH(GSI))

Sitzung Einordnung: Cryring@ESR