



Contribution ID: 45

Type: **Invited**

Status of the low energy storage ring CRYRING@ESR

Thursday, 20 September 2018 09:00 (30 minutes)

Heavy, highly charged ions stored at low energy are ideal probes for various questions of modern physics that range from tests of QED especially at high fields to detailed investigations of nuclear reactions. An early installation of the low-energy storage ring LSR, a Swedish in kind contribution to the FAIR project in Darmstadt/Germany, provides the necessary environment for precise experiments with slow, highly charged ions. During the last years, the immensely successful storage ring CRYRING has been connected to the powerful source of heavy, highly charged ions that is GSI/FAIR to form the CRYRING@ESR facility.

The ring can store ions ranging from a few 100 keV/nucleon to a few MeV/nucleon. Heavy, highly charged ions up to bare or hydrogen like uranium are produced at the GSI accelerator facility at about 400 MeV/nucleon, decelerated and cooled in the experimental storage ring ESR to about 4 MeV/nucleon, and then transported into CRYRING@ESR. There the ion beam can be decelerated further, cooled with an electron cooler, and stored for experiments, or extracted. An in ring gas target will be setup as well as a number of single particle detectors and laser-ion beam interaction zones. Three experiments have already been accepted by the GSI/FAIR general program advisory committee for beams from ESR and from the local source for the running period 2018/19. Additionally, 17 letters of intent have been received for experiments and tests with the local injector.

The ring installation has been finished. The local injector produced successfully H_2^+ ions accelerated to 300 keV/nucleon that were injected into the ring, stored, accelerated and cooled. Hence, all basic functions have been demonstrated. The remaining commissioning is dedicated to transfer first signals into routine operation and to get ready to accept ESR beam.

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Session Classification: Session 11 - Storage rings

Track Classification: Storage rings