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## The HITRAP deceleration facility - heavy HCI at low energies

The HITRAP facility, located at the GSI Helmholtzzentrum fuer Schwerionenforschung GmbH in Darmstadt, Germany, is designed to decelerate and cool heavy, highly charged ions (HCI) created by the GSI accelerator complex [1]. The system consists of a two-stage linear decelerator, followed by a cryogenic Penning-Malmberg trap for subsequent ion cooling. The deceleration stages reduce the ion energy from 4 MeV/u to 500 keV/u and to 6 keV/u respectively, before forwarding a slow, but hot ion bunch towards the cooling trap. The trap is operated in a so-called nested configuration, in which the electrons, created by an external photo-electron source, are stored simultaneously with the HCI and serve as a cold thermal bath. After cooling, the ions can be transported via a low-energy transfer beamline towards various attached experiments [2]. A dedicated small ion source (Dresden EBIT) is attached to the beamline and used for commissioning of the cooling trap as well as a source of light HCI for attached experiments [3]. So far, deceleration of heavy HCI has been set up down to 6 keV/u, though the process is somwhat lengthy, hampered by a low delivery rate of a single ion bunch per 40 seconds. The subsequent electron cooling process is under development with promising results. Ions from the EBIT are regularly stored and mixed with electrons. Recently, the first indications of electron cooling of locally-produced HCI in a Penning trap could be achieved, a major milestone towards heavy HCI at eV and sub-eV energies. The current status of this development as well as future aspects will be presented.

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