Contribution ID: **281** Contribution code: **TUPB030** Type: **Poster Presentation**

High performance megawatt uranium beams at GSI UNILAC

Tuesday 27 August 2024 16:00 (2 hours)

The 50 years old GSI-UNILAC (Universal Linear Accelerator) as well as the heavy ion synchrotron SIS18 will serve as a high current heavy ion injector for the FAIR (Facility for Antiproton and Ion Research) synchrotron SIS100. The UNILAC together will provide for short and intense pulses. This contribution presents the results of the full performance high current uranium beam machine experiment campaign at UNILAC, conducted in the last three years. In order to determine the behavior of uranium beams, the transverse beam emittance at five selected measurement positions along the complete UNILAC have been measured for the first time in several machine investigation runs. A significant improvement in beam brilliance was achieved by using the pulsed hydrogen stripper at 1.4 MeV/u. It could be shown that extremely low horizontal emittances, i.e. very high brilliances, are achieved along the complete UNILAC up to the SIS injection. Besides high intense uranium beam with charge state 28+ also multi charge beam, comprising 27+, 28+, 29+ uranium ions, commonly recharged primarily to charge state 73+ using a carbon foil, were investigated and a record current of 3.6 emA has been achieved.

Footnotes

Funding Agency

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Session Classification: Tuesday Poster Session

Track Classification: MC3: Proton and Ion Accelerators and Applications: MC3.2 Ion linac projects