

Characterization of a Multi-Reflection Time-of-Flight Mass Separator (MR-ToF MS) for the Offline Ion Source of PUMA

Tuesday 28 June 2022 16:58 (2 minutes)

The antiProton Unstable Matter Annihilation (PUMA) project aims at investigating the nucleon composition in the matter density tail of short-lived as well as stable isotopes by studying antiproton-nucleon annihilation processes. For this purpose, low-energy antiprotons provided by the Extra Low Energy Antiproton (ELENA) facility at CERN will be trapped together with the ions under investigation. While the unstable ions will be supplied by the Isotope mass Separator On-Line DEvice (ISOLDE) at CERN, the stable ions are taken from an offline ion source that should be able to provide a cooled and bunched as well as isotopically pure ion beam. It is used to benchmark the antiproton nuclear annihilation process as well as for development and reference measurements at ELENA. The ion source contains a radio-frequency quadrupole cooler-buncher for ion accumulation and bunching. In addition, an MR-ToF MS is used to clean the beam. In this respect, the poster gives an overview of the working principle of the MR-ToF MS designed for the PUMA offline ion source and provides first experimental results of reference measurements performed with stable nuclei.

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Session Classification: Posters

Track Classification: Nuclear Physics