Contribution ID: **27** Type: **Invited (In person)**

The PUMA experiment at ELENA and ISOLDE

Thursday 30 November 2023 10:00 (25 minutes)

PUMA (antiProton Unstable Matter Annihilation) is a new experiment at CERN since 2021. It aims to utilize antiprotons' unique properties to probe the nucleonic composition of the tail of the nuclear density distribution of both stable and exotic nuclei. After formation of antiprotonic atoms with the isotope of interest, antiprotons will annihilate on the nucleus's surface. This process yields annihilation products whose total electric charge allows to reconstruct the isospin distribution and thus grants access to a new observable: the neutral-to-proton ratio. These insights can provide a new perspective for investigating quantum phenomena such as nuclear halos and neutron skins. In order to trap antiprotons with exotic nuclei, PUMA aims to transport up to one billion antiprotons from the AD (Antiproton Decelerator) to the ISOLDE (Isotope Separator On-Line Device) facility.

In this presentation the motivations and objectives of PUMA will be presented. Additionally, an overview of the current progress in the installation of PUMA at AD and ISOLDE will be provided, together with first physics cases. Furthermore, we give a detailed description of the main components of the apparatus necessary to bring PUMA to life.

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Session Classification: Operation and New Developments II