



Contribution ID: 98

Type: Oral Contribution

Isomeric lifetime measurement of the neutron-rich isotope ^{189}Ta

Tuesday 25 October 2022 16:10 (15 minutes)

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In March 2021, the DEcay SPECTroscopy (DESPEC) experiment S452 was performed at GSI Helmholtzzentrum für Schwerionenforschung. The focus of the experiment was to measure the lifetimes and energies of the first excited states of neutron-rich Os, W and Hf isotopes in the $A \sim 190$ mass region, in search for prolate-oblate shape transition [1]. The experimental setting, which was centered on ^{190}Ta , allowed us to investigate the single-particle structures of isomers in this region and connect their decays to the shape evolution.

The isomeric state for the nucleus of interest, ^{189}Ta , was populated by the fragmentation of ^{208}Pb primary beam impinging on ^9Be target [2]. The cocktail beam was separated and identified using FRagment Separator (FRS) [3] to implant the nuclei of interest in the active stopper, Advance Implantation Detector Array (AIDA). The AIDA consist of 3 Double Sided Silicon Strip Detectors (DSSSDs) [4] and located in the final focal plan of the FRS. The gamma rays from the implanted ions were detected by thirty six $\text{LaBr}_3(\text{Ce})$ detectors the Fast TIMING Array (FATIMA) [5] and two cluster HPGe detectors, 7 crystal each (EUROBALL), surrounding the AIDA. The $\text{LaBr}_3(\text{Ce})$ detectors were used for fast-timing spectroscopy, while HPGe provides precise energy information.

Data obtained in this experiment is analyzed on an event-by-event basis, for which the analysis is in progress. An overview of the DESPEC setup, the analysis procedures regarding this experiment and a preliminary result of the isomeric lifetime measurement of ^{189}Ta will be presented in the conference.

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Session Classification: P2 Nuclear Structure, Spectroscopy, and Dynamics

Track Classification: P2 Nuclear Structure, Spectroscopy, and Dynamics