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(UG*) (POS-20) ARIES: the New β -Tagging Ancillary Detector at TRIUMF's GRIFFIN

Tuesday 28 May 2024 17:51 (2 minutes)

Decay spectroscopy stands as a pivotal tool in unravelling the intricate properties of atomic nuclei, offering unparalleled insights into the fundamental processes governing the decay of rare isotopes and shaping our understanding of nuclear physics. GRIFFIN (Gamma-Ray Infrastructure For Fundamental Investigations of Nuclei) is a world-leading facility for decay spectroscopy with rare-isotope beams, located at the TRIUMF-ISAC-I facility at the University of British Columbia campus in Vancouver, Canada. The GRIFFIN spectrometer is equipped with 16 high-purity germanium clover detectors coupled to a fully digital data acquisition system, enabling high gamma-ray detection efficiency and data throughput. ARIES (Ancillary detector for Rare Isotope Event Selection) is a new ancillary beta detector formed of a self-supporting array of plastic scintillator tiles which will fit inside GRIFFIN and aims to dramatically expand the beta detection capabilities within this experimental setup.

This poster summarizes the research conducted by a UBC physics student during an 8-month work term at TRIUMF. The focus of the work was the development of ARIES —a novel beta detector designed to enhance the capabilities of the GRIFFIN spectrometer. This research outlines the comprehensive characterization and testing of ARIES scintillator tiles and SiPMs, alongside the preliminary stages of construction and validation of a prototype. Through meticulous experimentation and analysis, this work contributed to the refinement and optimization of ARIES, ensuring its integration with the GRIFFIN spectrometer. The coupling of the new ARIES detector within the GRIFFIN spectrometer will facilitate deeper insights into the fundamental properties of nuclei and advance our understanding of the universe at its most fundamental level.

Keyword-1

Decay spectroscopy

Keyword-2

Beta Detector

Keyword-3

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