Contribution ID: **1** Type: **Poster + Flashtalk**

ARDE: Neural network-based algorithms for discrimination between electrons and γ-rays

The results of the ARDE project will be presented, aiming to develop innovative algorithms based on neural network architectures to discriminate between signals induced by electrons and γ-rays in semiconductor detectors, specifically in Si(Li) and HPGe. The algorithm performances for internal conversion electron spectroscopy measurements in an energy range from ~300 keV to ~1-2 MeV will be investigated. Using techniques based on artificial intelligence and machine learning enables the simultaneous analysis of all the information of the signal shape, rather than relying on a correlation between two parameters as in traditional PSA techniques. Thanks to ARDE, the instrumentation used for internal conversion electron spectroscopy measurements will be simplified, moving away from the current reliance on magnetic γ-ray filters. These filters cause significant technical issues during measurements, such as making detection efficiency highly dependent on the energy of the electrons. Furthermore, the techniques developed in this project will provide the foundation for other applications, such as those related to the search for rare events (e.g., 0νββ decay) and medical applications, where measuring β-radiation doses and energy in the presence of γ-radiation background is crucial.

AI keywords

PSA, Analysis

Primary author: MARCHINI, Naomi (Istituto Nazionale di Fisica Nucleare)

Presenter: MARCHINI, Naomi (Istituto Nazionale di Fisica Nucleare)

Track Classification: Patterns & Anomalies