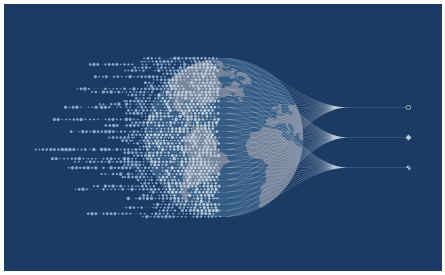

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-detector characteristics as neutron detector and gamma detector

For verification purposes, it is crucial to obtain comprehensive information time-efficiently. Alongside gamma measurement results, neutron data plays a key role in the evaluation. A promising approach is the simultaneous detection of gamma and neutron radiation using a combined detector, such as the NaIL detector. It is based on sodium iodide (NaI). The NaI is doped with ⁶Li, enabling neutron detection through the ⁶Li(n,t)α reaction. The secondary particles produce detectable scintillation light pulses. Due to the reaction's high Q-value of 4.78 MeV, these signals are comparable to those of high energy gamma photons. The discrimination of neutron and gamma radiation is realized by pulse shape analysis. Previous work focused on neutron detection using various neutron sources with and without HDPE moderation. In addition to these investigations, this study examines the performance of the NaIL detector in gamma detection. The aim is to evaluate the specific gamma quality and performance of the NaIL detector compared to common NaI. Different gamma sources are used to assess parameters such as the FWHM resolution, providing insights into their suitability for high precision gamma spectroscopy, simultaneous with neutron detection. This type of detector may significantly enhance the capability of gamma and neutron detection during on-site inspections.

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