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Scintillation detectors for fast neutron/gamma discrimination using PSD technique on charge integration ratio

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Charge integration ratio (Q_{ratio}) method in the Pulse Shape Discrimination (PSD) technique has been widely used to discriminate between fast neutron and gamma by using scintillation detectors. Analog pulses from the detectors are digitized by a high-speed sampling digitizer and recorded for digital pulse processing. In this work, we introduce an EJ-276 plastic scintillator and a Stilbene scintillator detector to analyze fast neutrons from a radioisotope Cf-252 and from a proton therapy, respectively. Here, the EJ-276 scintillator detector is set up for measuring neutrons from the Cf-252 source, and the Stilbene detector is used measure neutrons produced from a water phantom irradiated by the proton therapy. Experiment set-up, PSD technique on Q_{ratio} and data analysis for fast neutron and gamma background discrimination will be presented in detail at the workshop.

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