Project Overview

- Pulse-shape-discrimination (PSD) systems can be used with some scintillators to discriminate between neutrons and gammas.
- The motivation behind this work is to quantify the best PSD system that most accurately discriminates.
- The PSD performance of a digital, charge-integration PSD system (CAEN V1720) is compared against an analog, zero-crossing PSD system (Mesytec MPD-4).
- Measurements were performed using an organic liquid scintillator (EJ-309) coupled with a photo-multiplier tube (ETL-9821B).
- A Cf-252 spontaneous-fission source was used to provide neutrons and gammas.
- Figures of merit (FOM) were used to assess and compare the performance of the PSD systems.
- Under the measurement constraints, digital PSD system out-performed analog PSD by approximately 15%.

Measurement Results

![Digital PSD](image)

- The V1720 outperformed the MPD4 by 15% and future work will include using a larger dynamic range (8V instead of 2V).

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