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Discriminating Neutron-Gamma Waveforms from Novel Scintillation Detectors using Digital Pulse Processing[1] T. HARRINGTON, S. LAKSHMI, P. CHOWDHURY, University of Massachusetts, Lowell, MA, USA, J. GLODO, K. SHAH, Radiation Monitoring Devices Inc., Watertown, MA, USA — In this research, we report the results of neutron-γ pulse shape discrimination studies performed with digital signal processing techniques. Two novel scintillator crystals, $Cs_2LiLaBr_6$ (CLLB) and Cs_2LiYCl_6 (CLYC), (provided by Radiation Monitoring Devices Inc.), which have different pulse shapes for neutron and γ-ray detection, were used to detect neutrons and γ-rays from a PuBe source enclosed in paraffin. Following digitization of the pulse waveforms with a 1 GHz Lecroy Digital Oscilloscope, a pulse shape discrimination algorithm was explored through custom C++ programs integrated within the ROOT analysis software developed at CERN. The selection of integration windows was optimized to provide the greatest separation between the two signals. The latest results for the CLYC and CLLB crystal will be presented and the neutron-γ discrimination capabilities of the two detectors will be compared.

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