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#11-231 Regional variation in neutron/gamma pulse-shape discrimination in an organic scintillator

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This paper describes the use of a Hamamatsu H13700 16x16 multi-anode photomultiplier tube (MAPMT) to quantify regional variations in the confidence of neutron/gamma discrimination across the volume of a continuous, organic scintillator. The MAPMT outputs are multiplexed to a single analogue input channel on a mixed-field analyser performing pulse-shape discrimination (PSD) by pulse-gradient analysis (PGA). Accuracy of the PSD response is compared for events occurring within different regions of the scintillator volume by varying the centre of interaction using an aperture collimator. Width and uniformity of the light pulse dispersion is inferred by varying the number of readout anodes used and comparing the change in analogue output to supplied crosstalk data. Although this study is ongoing, these findings could inform future PSD developments to increase certainty in particle identification and position-sensitive neutron counting methods for nuclear safeguarding and materials assay.

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