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A compact scintillation detector for mobile neutron spectroscopy

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A compact scintillation detector, comprising of plastic scintillators capable of pulse shape discrimination, coupled to silicon photomultipliers and digital readout electronics, has been constructed and characterised using a range of neutron and gamma radiation fields with energies between 0.5 and 14 MeV. Experimental measurements will be presented and compared with simulations built using GEANT4. In addition, measurements with neutron beams ranging in energy between 14 MeV and 66 MeV, produced at the iThemba LABS cyclotron facility will be used to illustrate the pulse shape discrimination capabilities of the digital data acquisition system. The potential of the device for both dosimetry and security applications will be discussed, together with the challenges of implementing a compact neutron/gamma-ray detector for use in industry.

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