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Quantum Dot-Based Scintillators for Neutron Detection

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There is significant interest in developing cost-effective radiation detectors with particle identification capabilities for both fundamental research and industrial applications. While high-resolution detectors can distinguish alpha, beta, and gamma rays, identifying neutrons remains a major challenge. Quantum dots, an emerging technology with diverse potential applications, including scintillators, present a promising solution. In this study, we explore the feasibility of using quantum dots for neutron detection. Novel quantum dots were synthesized, and a custom detection system was designed to evaluate their neutron detection capabilities using the Sheffield fast pulse D-T neutron generator.

Authors: ZHAO, Miao; STOWELL, Patrick (University of Sheffield); FOSTER, Rob (University of Sheffield); RAKOVICH, Sasha; Dr KATORI, Teppei (King's College London)

Co-authors: GARCIA LOPEZ, Carolina (King's College London); MARTINDALE, Elliot (King's College London); COLE, James (King's College London)

Presenter: Dr KATORI, Teppei (King's College London)

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