



Contribution ID: 127

Type: **Poster Presentation**

Quantum Dot-Based Scintillators for Neutron Detection

Wednesday 5 March 2025 13:34 (1 minute)

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.

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Session Classification: Lunch and Posters