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Mapping Scintillation Light Distribution of Individual Neutron Interactions in Scintillator Screens using LumaCam Detectors

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LumaCam detectors have a structure resembling many established scintillator-based imaging detectors. The key difference is the imaging chip being fast enough to identify the individual scintillaton photons produced by a neutron interaction in the scintillator screen. This information can be used to provide enhanced spatial and temporal resolution, as well as noise suppression and particle discrimination capabilities. These advantages have led to a rapid growth in the usage of LumaCam detectors in the recent years, especially for time-of-flight imaging applications. To fully utilize their potential, a detailed understanding of the spatial and temporal distribution of the scintillation light produced by neutrons as well as possible noise sources is required. We will present fundamental research on neutron scintillator screens, using LumaCam detectors to map the photon distribution of individual neutron interactions.

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