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# nFacet 3D: Sensitive Neutron Detection for Timely Source Location and Identification

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Fast neutrons from various sources, including special nuclear materials, have energy in the O(1-10) MeV range with attenuation length of up to 100 m in the air. As such, they potentially provide a strong signature of where they come from.
The relatively isotropic characteristic of the naturally-occurring neutron background makes directional measurements superior to simple neutron counters currently used in nuclear security. That information can also be used to derive a more realistic dose measurement providing a mean to improve on neutron dose estimates.
We will present the nFacet project and recent developments of a novel detector technology that provides high sensitivity to neutron detection combined with directional and spectral measurements.
The detector imaging capabilities is the result of many years of R&D for the a SoLid reactor neutrino experiment, an experiment that requires high neutron efficiency.
In this presentation, I will give an overview of the project and will describe the detector system and performance from recent measurement campaigns. I will develop on the new machine learning techniques we have applied from pulse shape discrimination to higher level analysis. Finally, I will conclude on the prospects for future use of this technology and currently pursued improvements towards dual a full gamma/neutron detector system.

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