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Muon Tracking in an Opaque Scintillator Detector with LiquidO

Monday 7 April 2025 16:00 (15 minutes)

The LiquidO Consortium is bringing a novel approach to particle detection by using opaque scintillator to achieve self-segmentation down to the millimetre scale. Opacity via short scattering length stochastically confines scintillation photons close to the point of production and arrays of wavelength-shifting fibres trap and transmit the light to, typically, silicon photomultipliers.

At Sussex, we use 64-fibre detector prototypes with a 3.2 mm fibre pitch. The prototypes are characterised with cosmic ray muons, and using a wax-based opaque scintillator a one-dimensional position resolution of 0.45 mm is achieved. This talk will discuss the muon tracking capabilities of a small-scale LiquidO detector, as well as compare the performance of the prototypes with transparent and opaque scintillator.

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