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LiquidO: Neutrino Detection in Opaque Media

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The LiquidO collaboration proposes a new method for detecting particles using opaque scintillator, which breaks the traditional paradigm of transparency. LiquidO technology exploits the stochastic confinement of the scintillation photons within a few cm radius near its creation point due to the short scattering length and the collection of the trapped light through arrays of wavelength-shifting fibres. This technology allows for highly efficient identification of particles, including positron, electron, and gamma events, with the ability to distinguish between them on an event-by-event basis. During this talk, we will share the results obtained from a 10-litre prototype and discuss the use of LiquidO in the first reactor antineutrino detector, which is expected to be located at the “ultra-near” site of EDF-Chooz, approximately 35 meters from the core of one of the most powerful European nuclear plants, with minimal overburden.

Abstract

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