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CLOUD: fundamental reactor antineutrino physics using the novel LiquidO detection technology

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The CLOUD collaboration is pioneering the first fundamental research reactor antineutrino experiment using the novel LiquidO technology for event-wise antimatter tagging. CLOUD's program is a potential byproduct of the AntiMatter-OTech EIC/UKRI-funded project focusing on industrial reactor innovation. The experimental setup is envisioned to be an up to 10 tonne detector, filled with an opaque scintillator and crossed by a dense grid of wavelength-shifting fibres. The detector is planned to be located at EDF-Chooz at around 35 m from the core of one of the most powerful European nuclear plants, with minimal overburden. Detecting of order 10,000 antineutrinos daily and with a high (≥ 100) signal-to-background discrimination, CLOUD aims for the highest precision of the absolute flux, along with explorations of beyond the Standard Model physics. Subsequent phases plan to exploit metal-doped opaque scintillators for further detection demonstration, including exploring the potential for surface detection of solar neutrinos.

Secondary track

T11 - Detectors

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