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First Result of the Search for Antineutrino Disappearance at SoLid

Wednesday 30 August 2023 14:30 (15 minutes)

The SoLid neutrino experiment is a short baseline neutrino experiment installed at 6.2 m from the BR2 reactor, at the SCK-CEN laboratory in Mol, Belgium. The detector consists of 12,800 dual-scintillator cubes (PVT and LiF:ZnS) read out by 3,200 SiPMs. The system is installed inside an ISO-container and shielded against external backgrounds by water and polyethylene slabs. The experiment has operated smoothly from spring 2018 to summer 2020 (Phase-I) and from December 2021 to July 2022 (Phase-II) following an upgrade of the type of SiPMs.
After a period of development of the analysis, the calibration and neutrino selection methods have undergone significant improvements that have resulted in a competitive signal-to-background ratio of approximately 1:3, detection of ˜100 antineutrinos per day, and good energy resolution, all necessary for an oscillation analysis and antineutrino spectrum measurement at the level of a few percent based solely on the positron energy.
This talk will present the experiment and detector system, the analysis and the first result of the oscillation analysis using 13 reactor cycles of the phase-I dataset.

Submitted on behalf of a Collaboration?

Yes

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