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Coherent Elastic Neutrino Nucleus Scattering as a Probe to Study Reactor-Antineutrino Fluxes and Spectra

Since their first observation in 1956, reactor antineutrinos have almost been exclusively measured through the Inverse Beta Decay (IBD) process, allowing to achieve a precise understanding of their fluxes and spectra above 1.8 MeV. The Coherent Elastic Neutrino Nucleus Scattering (CEvNS) process, recently observed for the first time by the COHERENT collaboration, offers a new channel for the detection of reactor antineutrinos with the possibility to access for the first time the low energy part of the spectrum.

This poster reports on a sensitivity study which aims at estimating the potential of ultra-low threshold bolometric detectors to measure the low energy part of a reactor antineutrino spectrum as typically emitted by commercial pressurized water reactors. Motivated by recent findings from the latest generation of IBD experiments (Daya Bay, RENO and Double Chooz) the sensitivity of CEvNS to a potential distortion of the reactor antineutrino spectrum is also presented.

Mini-abstract

Potential and complementarity of CEvNS to measure reactor antineutrinos fluxes and spectra.

Experiment/Collaboration

NENuFAR

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