

Neutrino Elastic-scattering Observation with NaI(Tl)(NEON)

Monday, 12 June 2023 17:30 (20 minutes)

The NEON experiment aims to observe coherent elastic neutrino-nucleus scattering (CEvNS) using reactor anti-electron neutrinos with NaI(Tl) crystal detectors at the Hanbit nuclear power plant in Yeonggwang, South Korea. Although CEvNS has been observed by the COHERENT collaboration using a spallation neutron source, the same process with reactor neutrinos has not yet been observed. The NEON detector consists of a 16.5 kg NaI(Tl) target mass installed 24 meters from the reactor core. The probability of CEvNS observation relies on detector performance, such as background level and low-energy threshold. The light yield of the detector is approximately 23 NPE/keV, which is about 50% higher than the previous detector due to R&D. The background level of roughly 6 counts/day/kg/keV and a below 0.6 keV energy threshold have already been achieved. Further analysis is ongoing to optimize the low-energy threshold through waveform simulation, which is used as a scintillating signal sample for Boosted Decision Trees (BDT) training. Current physics data were collected during both reactor shutdown (5 months) and reactor operation (ongoing for approximately 5 months). This presentation will provide an overview and current status of the NEON experiment.

Secondary category for the parallel session (optional)

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