

Recent results from the NEON experiment (Neutrino Elastic-scattering Observation in NaI)

Monday 7 April 2025 14:45 (45 minutes)

The NEON experiment aims to detect coherent elastic neutrino-nucleus scattering (CEvNS) from reactor antineutrinos.

Located 23.7 meters from the 2.8-GWth reactor core at the Hanbit nuclear power plant, NEON uses a 16.7 kg NaI crystal array as its target material.

Since April 2022, NEON has collected over 1,000 days of physics data, with 78% recorded during reactor operation and 22% during reactor-off periods.

Leveraging advancements in NaI crystal detector technology, the detector has demonstrated stable performance, surpassing expectations with an unprecedented light yield of 25 photoelectrons per keV energy deposit.

As a result, a single-hit background rate of 7 counts/day/kg/keV at 0.6 keV has been achieved.

This presentation will provide an overview of the NEON experiment within the context of nuclear reactor neutrino physics, highlight recent achievements in dark sector particle searches, and discuss future plans for CEvNS observation.

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Session Classification: Reactor antineutrino experiments II