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First constraints on coherent elastic neutrino-nucleus scattering at reactor site with the CONUS experiment

Friday, 19 February 2021 10:40 (20 minutes)

The detection of neutrinos through Coherent Elastic Neutrino Nucleus Scattering (CE ν NS) process opens a new window to study the fundamental properties of this elusive particle and to probe physics beyond the Standard Model. The CONUS experiment –operational since April 2018 –is located at 17 m from the 3.9 GW_{th} core of the nuclear power plant Brokdorf (Germany) and aims to detect CE ν NS in the fully coherent regime with four 1 kg-sized HPGe point-contact detectors with a ~ 300 eV_{ee} energy threshold. The full spectral analysis of the first CONUS dataset including 248.7 kg.d reactor-on and 58.8 kg.d reactor-off allowed to set the current best limit on the coherent elastic scattering of reactor antineutrinos. This result will be presented, along with the details of the systematic uncertainties and the full Monte-Carlo description of the background. A special emphasis will be put on the strategy followed by the collaboration to further reduce the uncertainties, in particular via a dedicated measurement of the ionization quenching factor of nuclear recoils in germanium.

Collaboration name

CONUS

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