

Status of the NUCLEUS experiment

Thursday 23 March 2023 11:00 (15 minutes)

Coherent elastic neutrino nucleus scattering (CEvNS) is a well-predicted Standard Model process only recently observed for the first time. Its precise study could reveal non-standard neutrino properties and open a window to search for physics beyond the Standard Model.

NUCLEUS is a CEvNS experiment conceived for the detection of neutrinos from nuclear reactors with unprecedented precision at recoil energies below 100 eV. Thanks to the large cross-section of CEvNS, an ultra-low threshold cryogenic detector of 10g of CaWO₄ and Al₂O₃ crystals is sufficient to provide a detectable neutrino interaction rate.

NUCLEUS will be installed between the two 4.25 GW reactor cores of the Chooz-B nuclear power plant in the French Ardennes, which provide an anti-neutrino flux of $1.7 \times 10^{12} \text{ } \nu / (\text{s cm}^2)$. At present, the experiment is under construction. The commissioning of the full apparatus is scheduled for 2023, and will then be moved to the reactor site.

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Session Classification: Experiments