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NUCLEUS - A Cryogenic Experiment to measure Coherent Elastic Neutrino-Nucleus Scattering at CHOOZ

The detection of coherent neutrino-nucleus scattering (CEvNS) opens a new window to study the fundamental properties of neutrinos and to probe physics beyond the Standard Model of Particle Physics.

NUCLEUS is a novel cryogenic neutrino experiment which allows for precision measurements of CEvNS at unprecedentedly low energies. It is based on recently demonstrated cryogenic detectors with nuclear-recoil energy thresholds in the 10eV regime.

NUCLEUS will be installed at a new experimental site in between the two 4.25GW reactor cores of the CHOOZ B nuclear power plant in France, aiming to start operation in 2022. The high cross-section of CEvNS will enable a 10% precision measurement of the process with a 10g detector in 1 year of data taking.

This poster presents the design, the current status and the physics potential of the experiment.

Mini-abstract

NUCLEUS is a 10g cryogenic experiment to measure the coherent elastic neutrino-nucleus scattering.

Experiment/Collaboration

NUCLEUS Collaboration

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