SCHOOL: Multi-Aspect Young-ORiented Advanced Neutrino Academy (MAYORANA) - International School II edition



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Type: Poster & Mini-talk

Toward Precision Physics Test with CEvNS Cryogenic COHERENT Csl detector

The coherent elastic neutrino-nucleus scattering (CEvNS) is a neutral-current weak interaction in which a low-energy neutrino (tens of MeV) scatters off a nucleus, producing a small nuclear recoil that is extremely challenging to detect. Due to the low energies involved, this process was experimentally observed only in 2017 by the COHERENT experiment. Its significance lies in the fact that its cross section is considerably larger than that of other neutrino interactions at similar energies, making it a valuable tool for testing Standard Model parameters and searching for new physics. Moreover, CEvNS is also an important background component in experiments aimed at detecting dark matter.

My poster will present the potential of future COHERENT collaboration detectors using cesium iodide at cryogenic temperatures to constrain key parameters in electroweak physics. We will discuss the level of precision that can be achieved in measuring Standard Model parameters such as the Weinberg angle, the neutron distribution radius of iodine and cesium, and the neutrino charge radius. Furthermore, the prospects of probing new physics scenarios involving exotic neutrino properties and the existence of new mediators predicted by extensions of the Standard Model will also be explored.

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