UNIVERSIDAD TECNICA
FEDERICO SANTA MARIA

Departamento de Física

Seminario Grupo de Física de Altas Energías

"COHERENT ELASTIC NEUTRINO-NUCLEUS SCATTERING IN THE STANDARD MODEL AND BEYOND""

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Abstract

Coherent elastic neutrino-nucleus scattering (CEvNS) is a neutral-current process in which a neutrino scatters off an entire nucleus. First theoretically predicted in the '70s, its detection has proven especially challenging due to the tiny nuclear recoil energies produced in the scattering. CEvNS was measured for the first time in 2017 by the COHERENT collaboration. This observation has opened the window to many physics applications, including Standard Model precision tests and searches for new physics. In this talk, I will discuss the physics potential of CEvNS. I will first briefly review the main features of CEvNS and the status of current observations. Then I will comment on their implications for tests of the Standard Model, namely the determination of the weak mixing angle and the extraction of nuclear structure information. Concerning physics beyond the standard model, I will present several applications: new neutrino interactions, the production of new particles, and the role of CEvNS as a background for dark matter direct detection probes.

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