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The CEvNS experiment at Jefferson Lab

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Coherent elastic neutrino-nucleus scattering (CEvNS) is a process in which MeV energy scale neutrinos scatter on a nucleus, which behaves as a single particle. Within the Standard Model (SM), CEvNS is described by the neutral current interaction of neutrinos and quarks, and, due to the nature of couplings, its cross-section is proportional to the neutron number squared. In 2017, the COHERENT collaboration announced the detection of CEvNS for the first time using a CsI(Na) scintillating crystal detector. The detection of CEvNS has motivated an increasing number of research activities in high-energy physics and in beyond the Standard Model (BSM) physics. It has also motivated the development of larger-scale detectors and technology to extend detectors' sensitivity into lower energy regimes. In addition to providing a new channel for the detection of neutrinos, there are many interesting physics applications of CEvNS-based experiments and, in particular, a new way to extract information on the weak mixing angle that is of great interest to Jefferson Lab (JLab) research activity. In this contribution, I will report on the studies to perform a CEvNS experiment at JLab. Surveying the neutrino production and fluxes at different positions around the experimental Hall A Beam Dump, we found a Decay-At-Rest (DAR) neutrino flux competitive with other facilities planning CEvNS experiments.

Primary author: GRAZZI, Stefano (Universita' di Messina and INFN)

Presenter: GRAZZI, Stefano (Universita' di Messina and INFN)

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