Contribution ID: **265** Type: **Poster**

The COHERENT experiment

Friday, 21 June 2024 17:30 (2 hours)

Coherent elastic neutrino nucleus scattering (CEvNS) was proposed 50 years ago within the standard model. The cross section of this process depends quadratically on the number of neutrons in nuclei and prevails over all other cross sections of known neutrino interactions in the allowed energy region, below approximately 50 MeV for heavy nuclei. At the same time, the recoil energy for this process is very small and difficult to detect. Thus, it was observed only in 2017 by the COHERENT experiment for the first time on the CsI target at Spallation Neutron Source (SNS) located in Oak Ridge National Laboratory (USA). The primary program of COHERENT is to detect CEvNS on different targets to study its cross section dependence on the number of neutrons in nuclei which can reveal deviations from the standard model and can be a probe for the nonstandard neutrino interactions. In addition to the first observation the COHERENT already succeeded in detecting this process on Ar and Ge targets with the latter very recently in 2023.
In this poster, we describe the current status of the CEvNS study in the COHERENT experiment as well as our efforts to measure inelastic neutrino interactions with O, Ar, I, Pb, and Th nuclei. We update our program for neutrino flux measurements at SNS with heavy water detectors. Also, we present other COHERENT efforts and possible reach at the Second Target Station of SNS.

Poster prize

No

Given name

Dmitrii

Surname

Rudik

First affiliation

University Federico II, Napoli

Second affiliation

INFN, Napoli

Institutional email

dmitrii.rudik@na.infn.it

Gender

Male

Collaboration (if any)

COHERENT

Primary author: RUDIK, Dmitrii (Istituto Nazionale di Fisica Nucleare)

Presenter: RUDIK, Dmitrii (Istituto Nazionale di Fisica Nucleare)

Session Classification: Poster session and reception 2

Track Classification: Neutrino interactions