



Contribution ID: 1178

Type: Parallel Talk

Studies of Coherency Effects in Neutrino-Nucleus Elastic Scattering at Reactors

Friday, 8 July 2022 17:00 (15 minutes)

Neutrino nucleus elastic scattering (νA_{el}) is an electroweak interaction of the Standard Model of particle physics. We formulate a quantitative and universal parametrization of the quantum mechanical coherency effects in νA_{el} [1], under which the experimentally accessible misalignment phase angle between nonidentical nucleonic scattering centers can be studied. We relate it to the conventional description of nuclear many-body physics through form factor and data-driven cross section reduction fraction [2]. Limits on the latest CsI and LAr data from COHERENT collaboration along with prospects of observing the νA_{el} process at the Kuo-Sheng Reactor Neutrino Laboratory with Germanium detectors with $O(100\text{ eV})$ threshold will also be presented.

[1] “Coherency in neutrino-nucleus elastic scattering”, S. Kerman et al., TEXONO Collaboration, Phys. Rev. D 93, 113006 (2016).

[2] “Studies of quantum-mechanical coherency effects in neutrino-nucleus elastic scattering”, V. Sharma et al., TEXONO Collaboration, Phys. Rev. D 103, 092002 (2021).

In-person participation

No

Primary author: Dr SHARMA, Vivek (Centre of Cosmology, Astrophysics and Space Science, GLA University)

Co-authors: Dr SINGH, Manoj Kumar (Institute of Physics, Academia Sinica); WONG, Henry Tsz-King (Institute of Physics, Academia Sinica)

Presenters: Dr SHARMA, Vivek (Centre of Cosmology, Astrophysics and Space Science, GLA University); SHARMA, Vivek (Virginia Polytechnic Institute and State University)

Session Classification: Neutrino Physics

Track Classification: Neutrino Physics