



Contribution ID: 5

Type: **not specified**

Nuclear Structure Physics in Coherent Elastic Neutrino-Nucleus Scattering

Tuesday, 21 July 2020 10:15 (15 minutes)

Recent measurement of coherent elastic neutrino-nucleus scattering (CEvNS) process by COHERENT collaboration has opened a new portal of exploring beyond the standard model physics. The primary uncertainty in CEvNS stems from underlying nuclear structure physics embedded in weak nuclear form factor. An accurate estimation of form factors is vital to the CEvNS program, since any experimentally measured deviation from the expected CEvNS event rate can either be attributed to new physics or to unconstrained nuclear physics. We present charge and weak nuclear form-factors and CEvNS cross section calculations on various nuclei using a microscopic many-body nuclear theory model based on Hartree-Fock approach with a Skyrme nuclear potential. We validate our charge form factor predictions against the elastic electron scattering data, and make predictions of weak form factors and CEvNS cross sections. Furthermore, we pay special attention to ^{40}Ar nucleus and attempt to gauge the level of theoretical uncertainty pertaining the description of ^{40}Ar form factor and its CEvNS cross section by comparing relative differences between different theoretical predictions.

Summary

Primary author: Dr PANDEY, Vishvas (University of Florida)

Presenter: Dr PANDEY, Vishvas (University of Florida)

Session Classification: Tuesday Morning 1