Contribution ID: **28** Type: **not specified**

Simulation of Low-energy Calibration using Geant4 in Search of Reactor Neutrino Coherent Scattering

Saturday 27 April 2024 10:00 (20 minutes)

REactor neutrino LIquid xenon Coherent Scattering experiment (RELICS) employs the liquid xenon time projection chamber (LXeTPC) technique for the search of neutrino coherent scattering off xenon nuclei (CEνNS) caused by $\sim$MeV neutrinos emitted from nuclear reactor.Such CEνNS interactions result in deposit energies of approximately $\sim$keV or sub-keV in LXe, demanding calibrations within the relevant energy ranges.To achieve this, ^{137}Cs and ^{60}Co sources will be utilized to calibrate γ and β-induced electronic recoils, while ^{241}AmBe and a Deuteron-Deuteron (DD) neutron generator will be employed for calibration of CEνNS.This presentation will focus on simulations of RELICS detector's response using various calibration sources, employing a GEANT4-based toolkit. Notably, it will provide detailed information on the design and simulation of the calibration process for CEνNS signals with energies ranging from approximately 0.1 to 1.0 keV, by selecting neutron double scatters originating from a collimated DD generator.

Author: YU, Jiachen

Presenter: YU, Jiachen

Session Classification: Workshop