31st International Seminar on Interaction of Neutrons with Nuclei: Fundamental Interactions & Neutrons, Nuclear Structure, Ultracold Neutrons, Related Topics (ISINN-31)



Contribution ID: 109

Type: not specified

Neutron Nucleus Parity Violation Experiment on the Back-n Beamline of CSNS

Thursday, 29 May 2025 17:25 (15 minutes)

Mofan Zhang1,2 1China Spallation Neutron Source 2Indiana University, zhangmo@iu.edu

Parity Violation (PV) effects in p-wave resonances of compound nucleus has always been the interest of the NOPTREX (Neutron Optical Parity and Time-Reversal EXperiment) collaboration since it may shine lights on the search of Time-Reversal Invariant Violation (TRIV) in the same resonances that exhibit a large PV effect. NOPTREX collaboration started performing experiments on the Back-n beamline since April of 2023 tested the performance of an in-situ 3He SEOP polarizer to prepare for a future PV experiment on the beamline. (n, γ) angular distribution measurements on 139La and NaI were performed on the GTAF BaF2 array in 2024. The asymmetry in angular distribution of γ -ray from (n, γ) reaction of p-wave resonance relates to the k(J) factor that theoretically correlates the effect of PV and TRIV and could be a method for searching for new p-wave resonances. From the last day of 2024 to early 2025, a measurement on the PV effect of p-wave resonance in 139La was performed. This measurement was the first attempt on PV measurements in China. We did not see the ~10% PV effect of La at 0.74eV p-wave resonance in an un-normalized crude analysis. Further analysis of this first PV experiment data is still ongoing. A second PV experiment with improved setup is preparing and the planned beamtime is late July of 2025.

Primary author: ZHANG, Mofan (Indiana University / CSNS)

Presenter: ZHANG, Mofan (Indiana University / CSNS)

Session Classification: Parallel Session 4: Nuclear and related analytical techniques in environmental and materials science

Track Classification: Parallel session: Parallel session 1