

Probing the reactor neutrino flux below the IBD threshold with CEvNS

Tuesday 22 August 2023 18:06 (24 minutes)

Most antineutrinos produced in a nuclear reactor have energies below the inverse beta decay (IBD) threshold, and have not yet been detected. We show that a coherent elastic neutrino-nucleus scattering (CEvNS) experiment with an ultra-low energy threshold like NUCLEUS can measure the flux of reactor neutrinos below the IBD threshold. Using a regularized unfolding procedure, we find that a meaningful upper bound can be placed on the low energy flux with CEvNS. However, it is difficult to establish the existence of the neutron capture component.

Primary author: LIAO, Jiajun

Co-authors: M, D; LIU, Hongkai (PITT)

Presenter: LIAO, Jiajun

Session Classification: parallel (room#302)

Track Classification: WG5: Neutrinos Beyond PMNS