

MAGNETO- ν : Searching for keV sterile neutrino dark matter in ^{241}Pu beta decays

Thursday 30 March 2023 15:50 (15 minutes)

Sterile neutrino of keV-scale mass is one of strong dark matter candidates. One of the ways for observing “sterile” neutrino is using nuclear beta decays. Non-zero mixing of sterile neutrino to electron neutrino allows them being emitted in nuclear beta decays, which modifies the shape of beta decay spectrum by adding a 4-th spectral component with reduced end-point energy. This modification produces the “kink” structure at the end-point of the sterile neutrino contribution in the beta spectrum, where is the decay Q value minus the mass of sterile neutrino. MAGNETO- ν experiment is a search for keV sterile neutrino in ^{241}Pu beta decays with magnetic quantum sensors. Enriched ^{241}Pu sources will be fully embedded into the magnetic quantum sensors and full decay energies from ^{241}Pu beta decays will be measured with an energy resolution of $O(10\text{ eV})$. In this talk, experimental overview as well as our first ^{241}Pu measurement with a preliminary limit on keV sterile neutrino mixing will be presented.

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Session Classification: SESSION 8: Sterile Neutrinos (CHAIR: George Fuller- UCSD)

Track Classification: Sterile neutrinos as dark matter