



Contribution ID: 33

Type: **Talk**

Testing the Gallium neutrino anomaly...with CEvNS?

Monday 9 June 2025 16:22 (18 minutes)

The capability to perform precision measurements of nuclear form factors or coupling constants with CEvNS relies on a precise knowledge of the incoming neutrino flux and spectrum. Isotopes decaying via electron capture (EC) represent a close-to-ideal neutrino source, thanks to the monoenergetic spectrum and the possibility of precisely measuring the source activity. However, the low energy of emitted neutrinos would require detectors with a trigger threshold at the eV level.

Lithium is the only target material that could practically be used to detect EC neutrinos, at the cost of a poor event rate due to the low neutron content. First, lithium's low nuclear mass would relax the threshold requirement up to 50 eV. Second, several lithium-containing crystals are commercially available and could be used as bolometers. Third, lithium can easily be enriched to 99% in ${}^6\text{Li}$ or ${}^7\text{Li}$, allowing to perform a differential measurement of the neutrino flux and to disentangle the vector and axial-vector components of CEvNS.

In this contribution, we will present the requirements for a hypothetical lithium-based bolometric experiment and its sensitivity to CEvNS. In addition, we will discuss the possibility to exploit such an experiment for a truly independent cross-check of the Gallium neutrino anomaly.

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Session Classification: Experiments 3