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Using isotopically enriched detectors to perform CEvNS measurements.

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After the latest measurement of the CEvNS process with a LAr detector, it has been shown that this interaction can be used as a powerful tool to perform tests of both the standard model and new physics scenarios. So far, one of the biggest challenges to perform precise measurements has been the determination of systematic uncertainties related, for instance, to quenching and form factors. We propose the use of several isotopically enriched detectors exposed to the same neutrino flux to measure CEvNS with precision. By performing a simultaneous measurement with these detectors, we show that the correlation between systematic uncertainties can be used to improve the accuracy of the measurement. We illustrate this idea by studying the sensitivity of a specific array of three germanium isotopes to the characteristic N^2 dependence of the cross section of this process. The idea is applicable to neutrinos coming from Spallation Neutron Sources, as well as to reactor neutrinos, and can be extended to other target materials such as silicon and nickel.

Reference to paper (DOI or arXiv)

arXiv:2011.10230

Your gender (free text)

Primary author(s) : SANCHEZ GARCIA, G.; MIRANDA, O. G.; GALINDO-URIBARRI, A.; SANCHEZ GARCIA, Gonzalo (CINVESTAV IPN)

Presenter(s) : SANCHEZ GARCIA, Gonzalo (CINVESTAV IPN)

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