
Contribution ID: **10** Type: **Invited**

# CEvNS in multi-ton scale dark matter experiments: Confronting vector and scalar interactions new physics signals

*Saturday 9 November 2019 14:40 (20 minutes)*

We classify new physics signals in coherent elastic neutrino-nucleus scattering (CEvNS) processes induced by B8 solar neutrinos in multi-ton xenon dark matter (DM) detectors. Our analysis focuses on vector and scalar interactions in the effective and light mediator limits after considering the constraints emerging from the recent COHERENT data and neutrino masses. In both cases we identify a region where measurements of the event spectrum alone suffice to establish whether the new physics signal is related with vector or scalar couplings. We identify as well a region where in addition measurements of the recoil spectrum are required so to establish the nature of the new interaction, and categorize the spectral features that enable distinguishing the vector from the scalar case. We demonstrate that measurements of the isospin nature of the new interaction and thereby removal of isospin related degeneracies are possible by combining independent measurements from two different detectors. We also comment on the status of searches for vector and scalar interactions for on-going multi-ton year xenon experiments.

**Author:** ARISTIZABAL, Diego (Universidad Tecnica Federico Santa Maria (USM))

**Presenter:** ARISTIZABAL, Diego (Universidad Tecnica Federico Santa Maria (USM))

**Session Classification:** Theory/pheno/nuclear

**Track Classification:** Theory / phenomenology