



Contribution ID: 72

Type: **Regular Talk** (15'+5')

Neutrino physics and Dark Matter searches with the Coherent CAPTAIN-Mills (CCM) experiment

Tuesday 29 November 2022 09:45 (45 minutes)

The 10 ton liquid argon (LAr) scintillation detector Coherent CAPTAIN-Mills, at the LANSCE facility of the Los Alamos National Laboratory, sits at a distance of 23 m from the core of the Lujan Center spallation source, which is a copious source of neutrinos from stopped pions, as well as, possibly, new particles belonging to a hypothetical Dark Sector of particle physics. Besides studying neutrino interactions in LAr at energies below 52.8 MeV, relevant for future neutrino experiments, CCM has a rich physics program comprising searches for Dark Photons, Axion-like Particles (ALPs), and neutral heavy leptons with masses in the range of keV to MeV, exploring new regions of parameter space for these searches. A prototype detector instrumented with 120 PMTs, CCM120 operated between 2018 and 2019, demonstrating the potential of such a detector for the search of Sub-GeV dark matter. The upgraded CCM200 detector, with 200 PMTs, improved shielding and LAr filtration and purification system is now taking beam. In this talk the status of the experiment, as well as results from CCM120 and expected sensitivity to new physics of CCM200 will be presented.

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Session Classification: Neutrino experiments

Track Classification: Neutrinos - Experiments