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Searching for Sterile Neutrinos with Coherent Captain Mills

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Despite evidence from LSND and MiniBooNE for sterile neutrinos at m^2 = 1 eV^2 in electron neutrino appearance experiments, corresponding muon-neutrino disappearance experiments have shown no anomalies. However, these experiments have been performed at a different energy scale compared to LSND and MiniBooNE. Coherent CAPTAIN Mills (CCM) is an experiment at the Lujan Center at LANSCE that uses a 10-ton liquid argon scintillation detector and the coherent elastic neutrino-nucleus scattering (CEvNS) process to measure muon neutrino disappearance at the LSND energy scale. The Lujan Center delivers a 100-kW, 800 MeV, 290 ns wide proton pulse onto a tungsten target at 20 Hz to generate a stopped pion source. The fast pulse is crucial for isolating the 30 MeV monoenergetic muon neutrinos in time and reducing neuron background. In this talk I will describe the CCM detector and show results from our Fall 2018 commissioning run and preliminary results from our Fall 2019 operating run.

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