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Searching for Sterile Neutrinos and accelerator produced Dark Matter with the CCM detector at LANSCE[1] TREVOR EDWARDS, Los Alamos National Laboratory, COHERENT CAPTAIN-MILLS COLLABORATION — Coherent CAPTAIN-Mills (CCM) is an experiment operating in the Lujan Center at Los Alamos Neutron Science Center (LANSCE) that is investigating multiple of the P5 Particle Physics Drivers. Using a 10-ton liquid argon scintillation detector and a stopped pion source generated by a 100 kW, 800 MeV proton beam onto a tungsten target, at 20 Hz, and a pulse width of 290 ns CCM is searching for sterile neutrinos and accelerator produced dark matter. MiniBooNE and LSND have shown compelling evidence for sterile neutrinos in short baseline neutrino oscillation experiments at a combined level of approximately 6 sigma, which warrants an investigation into their observed electron neutrino excess and muon neutrino disappearance. For this investigation the narrow pulse is crucial for isolating the monoenergetic muon neutrinos and rejecting beam related neutrons. Additionally, a narrow pulse increases sensitivity to accelerator produced sub-GeV dark matter, which are predicted by vector portal dark sector models, to thresholds that probe early universe relic density limits. In this talk I will describe the CCM detector and the Lujan Center and show first results from our 2019 beam run.

[1]Through LANL LDRD

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