

Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Prospects of Light Sterile Neutrino Oscillation and CP Violation Searches at the Fermilab Short Baseline Neutrino Facility DAVIO CIANCI, Columbia University, MARK ROSS-LONERGAN, Durham University, GEORGIA KARAGIORGI, Columbia University, ANDY FURMANSKI, University of Manchester — While current and last generation neutrino experiments have vastly improved our knowledge of the three neutrino oscillation paradigm, certain anomalous experimental signatures such as the LSND and MiniBooNE anomalies have arisen which have consistently evaded a standard three neutrino explanation. One possible scenario to explain these anomalies is the addition of one or more, mostly sterile, light neutrino mass states, leading to observable oscillations associated to new frequencies at relatively short baselines. This talk will describe how Fermilabs Short Baseline Neutrino (SBN) program will be uniquely poised to test the existence of light sterile neutrinos in scenarios including one, two or three such new states. To quantify SBNs sensitivity reach, we compare the experiments sensitivity to current, globally-allowed parameters for sterile neutrino oscillations. We also explore the possibility of including antineutrino beam running in the SBN run plan and study its impact on the potential physics reach, in particular from the perspective of new CP-violating phases which appear in these extended oscillation scenarios.

Davio Cianci
Columbia University

Date submitted: 28 Sep 2016

Electronic form version 1.4