Contribution ID: **914** Type: **Parallel**

Resolving DUNE oscillation parameter ambiguities in the 3+1 sterile neutrino scenario using SBN

Friday 6 July 2018 17:15 (15 minutes)

There has been significant interest in the possible effect that one or more light sterile neutrinos, hinted by several short-baseline neutrino oscillation experiments, can have on the measurement of the three-neutrino mixing parameters at the future long-baseline Deep Underground Neutrino Experiment (DUNE), with a particular focus on their effect on CP-violation measurements. By the time DUNE is operational, however, the Short-Baseline Neutrino (SBN) program at Fermilab will have performed high-precision measurements of possible light sterile neutrino oscillations, or will have provided stringent constraints to such scenarios. In this work we will present results on a joint SBN+DUNE light sterile neutrino oscillation analysis, combining both ν_e appearance and ν_μ disappearance oscillation measurements at both long and short baselines. By utilizing a fast MonteCarlo simulation of all SBN and DUNE detectors, we estimate the effects that either a positive or a null observation at SBN could have on DUNE sensitivities.

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Session Classification: Neutrino Physics

Track Classification: Neutrino Physics