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Constraining Non-Unitarity in the Neutrino Sector Using the SBN Facility

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In this talk, we discuss the potential for the Short Baseline Neutrino (SBN) program at Fermilab to constrain non-unitarity in the neutrino sector. Unitarity is a necessary assumption for working in the three neutrino paradigm, but lacks many rigorous bounds, as sensitivity to non-unitarity requires a very detailed understanding of flux and cross-section uncertainties. We present initial results of a sensitivity study for a search of instantaneous ν_e appearance and ν_μ disappearance at the SBN facility. We further discuss what possible improvements can be made on this in the future, in particular by utilising the high-statistics sample of neutral-current neutrino interactions available at SBND.

Primary authors: KARAGIORGI, Georgia (University of Manchester); Mr ROSS-LONERGAN, Mark (IPPP Durham University)

Presenter: Mr ROSS-LONERGAN, Mark (IPPP Durham University)

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