



## Poster session 4 – Friday 8 July

### P4.081 VALOR joint oscillation analysis using multiple LAr-TPC detectors in the Booster Neutrino Beam at Fermilab

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Anomalies have been observed in the past years by different experiments, being the most significant ones the  $\sim 3.8$  sigma nuebar appearance in a  $\sim 50$  MeV numubar beam from muon decay at rest observed by the LSND experiment and the  $\sim 3.8$  sigma nue and nuebar appearance in a  $\sim 1$  GeV neutrino beam from pion decay in flight observed by MiniBooNE. The Short Baseline Neutrino (SBN) program at Fermilab is a novel experimental effort aiming to resolve these anomalies and to perform the most sensitive search for sterile neutrinos to date. It will employ three Liquid Argon Time Projection Chambers (LAr-TPCs) with different designs, placed along the Booster Neutrino Beam (receiving exposure from the off-axis NuMI beam as well): SBND (with 112-tons active mass, situated at 110 m from the Booster neutrino beam target), MicroBooNE (with 89-tons active mass, situated at 470 m from the Booster neutrino beam target and taking data since October 2015) and the refurbished ICARUS/T600 (with 476-tons active mass, situated at 600 m from the Booster neutrino beam target).

VALOR is a well-established oscillation fitting group, who/that has led several oscillation analysis efforts in T2K and provided with sensitivity and detector optimisation studies for DUNE and Hyper-K. The neutrino oscillation framework developed by this group is able to perform fits of several samples and systematic parameters within different neutrino models and experiments. In this poster we will present the VALOR methodology for a joint fit of neutrino mixing parameters (initially in 3+1 and 3+2 frameworks) and of neutrino flux, interaction and detector model systematics, to the observable kinematical distributions of several semi-inclusive or exclusive SBND and MicroBooNE samples (ICARUS/T600 samples can be added at a later time).