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Short-baseline Neutrino Experiments

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Short Baseline Neutrino Program (SBN) at Fermilab aims to confirm or refute the anomalies observed at LSND and MiniBooNE in short baseline neutrino oscillation, which can be interpreted as existence of an additional state of neutrinos with eV-scale, also known as a "sterile neutrino." The technology of liquid-argon time-projection chambers (LArTPCs) is chosen
for all the SBN experiments, allowing separation of electrons from photons and thereby precisely measuring the probability of neutrino oscillation.
The SBN experiments also provide extensive measurements of neutrino-Ar interaction cross sections, and searches for physics beyond the Standard Model.

Operating in 2015-2022, MicroBooNE, Phase I SBN, has tested hypotheses of MiniBooNE anomaly with half of its collected data. The far detector of Phase II SBN, ICARUS, started taking data in 2022 and expects to have the first physics preliminary results this year, while the near detector, SBND, is rapidly progressing on its installation.

The other short baseline neutrino experiments receiving neutrinos produced by pions decay-at-rest, such as JSNS^2 and COHERENT,
also will provide complementary searches for sterile neutrinos via
oscillation measurements.

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