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Latest Results from the Search for a $\bar{\nu}_e$ Excess in the JSNS2 Experiment

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The JSNS2 (J-PARC Sterile Neutrino Search at the J-PARC Spallation Neutron Source) experiment searches for neutrino oscillations over a baseline of 24 m, targeting Δm^2 values around 1 eV^2 . Its primary goal is to provide a direct test of the LSND anomaly.

The experiment has carried out physics runs from 2021 to 2026, accumulating a total exposure of 6×10^{22} protons on target (POT) at J-PARC.

The first results from the search for a $\bar{\nu}_e$ excess, based on the 2022 physics run data set (0.8×10^{22} POT), were recently published. Since then, the analysis has been extended to include the 2024 physics run data set, corresponding to a total exposure of 2.0×10^{22} POT. In this talk, the latest results will be presented.

The results will be compared with expectations from sterile-neutrino oscillations as well as with a model-independent prediction obtained by directly scaling the LSND anomaly.

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