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MiniBooNE: current evidence for neutrino oscillations and a future test

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The MiniBooNE experiment, located at Fermilab on the Booster Neutrino Beamline, has searched for $\nu_\mu \to \nu_e$ and
$\overline{\nu}_\mu \to \overline{\nu}_e$ oscillations in the range $0.1 < \Delta m^2 < 5.0$~ev^2 as indicated by results from the LSND experiment. MiniBooNE has recently completed $\overline{\nu}_\mu$ running after collecting 11.3×10^{20} protons-on-target (POT). Combining those results with previously collected ν_μ data from 6.5×10^{20} POT yields a 3.8σ excess over background, consistent with that expected from the LSND result. A proposed followup experiment, MiniBooNE+, will test the oscillation signal hypothesis by searching for final state neutrons.

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