



SPEAKER: Teppei Katori

TITLE: **Observation of a Significant Excess of Electron-Like Events in the MiniBooNE Short-Baseline Neutrino Experiment**

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ABSTRACT

The MiniBooNE experiment at Fermilab reports results from an analysis of electron neutrino (ν_e) appearance data from $1.3E21$ protons on target (POT) in neutrino mode, an increase of approximately a factor of two over previously reported results (PRL110(2013)161801). A ν_e charged-current quasi-elastic (CCQE) event excess of 381.2 ± 85.2 events (4.5σ) is observed in the energy range $200 < E_{\nu QE} < 1250$ MeV. Combining these data with the electron anti-neutrino ($\bar{\nu}_e$) appearance data from $1.1E21$ POT in antineutrino mode, a total ν_e plus $\bar{\nu}_e$ CCQE event excess of 460.5 ± 95.8 events (4.8σ) is observed. If interpreted in a standard two-neutrino oscillation model ($\nu_{\mu} \rightarrow \nu_e$), the best oscillation fit to the excess has a probability of 20.1% while the background-only fit has a χ^2 -probability of $5E-7$ relative to the best fit. The MiniBooNE data are consistent in energy and magnitude with the excess of events reported by the Liquid Scintillator Neutrino Detector (LSND). All of the major backgrounds are constrained by in-situ event measurements, so non-oscillation explanations would need to invoke new anomalous background processes. <https://arxiv.org/abs/1805.12028>