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Looking for Sterile Neutrinos via Neutral-Current Disappearance with NOvA

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Three-flavor neutrino oscillations have successfully explained a wide range of neutrino oscillation data. However, the excess of events as seen by the LSND and MiniBooNE experiments and the deficit of events seen at the GALLEX and SAGE experiments when exposed to a calibration source can be interpreted as short-baseline neutrino oscillations consistent with the existence of a sterile neutrino state with a mass near 1 eV.

While these results are tantalizing, they are not conclusive, as they are in tension with null results from other short-baseline experiments and disappearance searches in long-baseline and atmospheric experiments. Resolving the issue of the existence of light sterile neutrinos has profound implications for both particle physics and cosmology.

The NOvA (NuMI Off-Axis ν_e Appearance) experiment may help clarify the situation by searching for disappearance of active neutrinos from the NuMI (Neutrinos from the Main Injector) beam over a baseline of 810 km. In this talk, I will present the latest results from NOvA on searching for oscillations of active neutrinos into sterile neutrinos by looking for a deficit of neutral current events relative to expectations.

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