

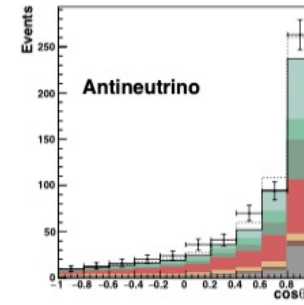
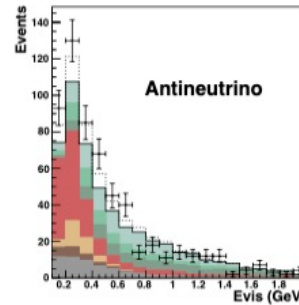
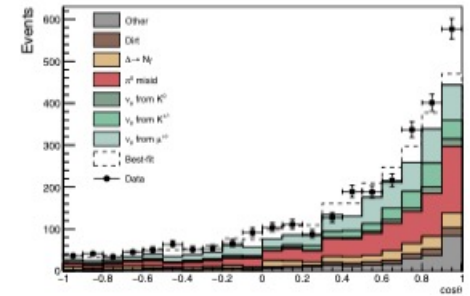
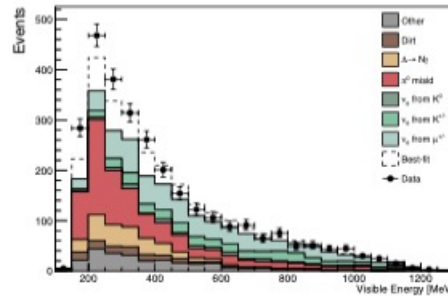
Short-Baseline Neutrino Anomalies

Mark Convery, SLAC

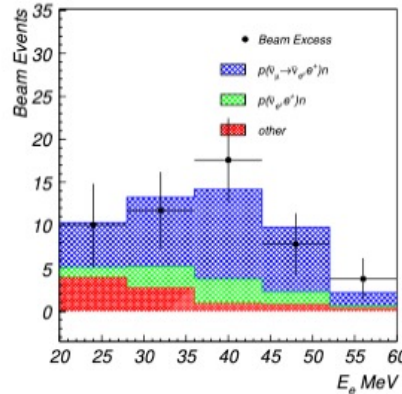
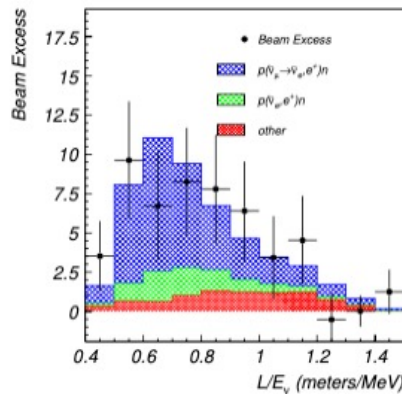
May 11, 2022

Long-standing Anomalies

- Current state of the field is nicely (and exhaustively) described in the NF02 White Paper (hep-ex 2203.07323)
- A number of anomalies have been observed in short-baseline neutrino experiments, which could indicate the presence of a sterile neutrino
- Our current interest lies mostly in pion-produced neutrino beams, which have seen a low-energy excess (LEE) in ν_e
- Anomalies persist, but 3+1 sterile neutrino interpretation has been (all but) ruled out
- Many other interpretations are possible



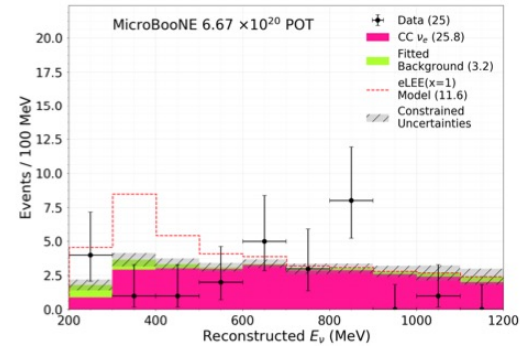
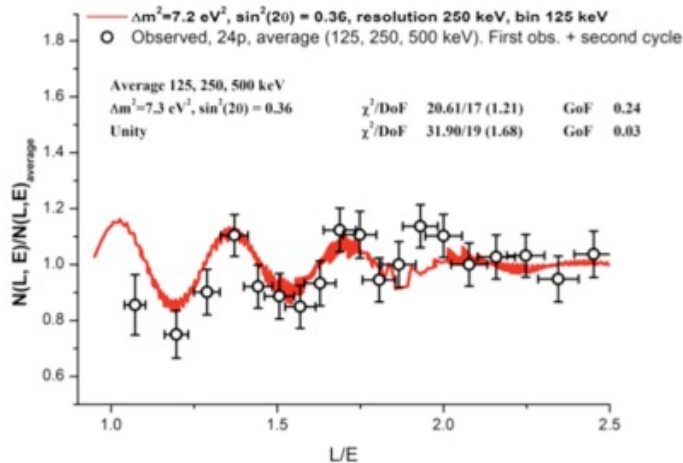
MiniBooNE



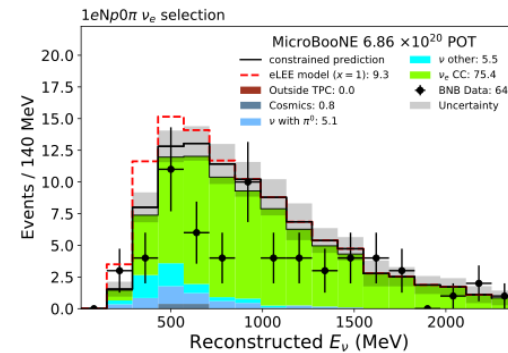
LSND

Recent Results

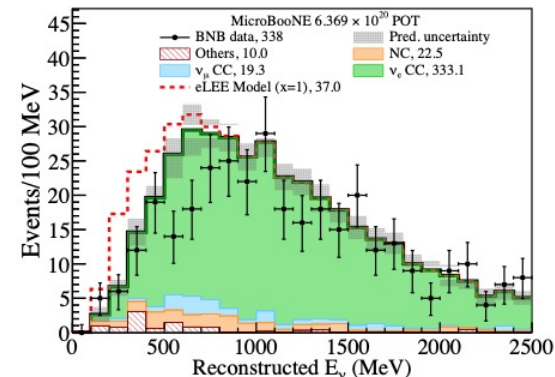
- MicroBooNE has recently released its first results (SLAC's Ran Itay key ML analyst)
 - Do not see evidence of MiniBooNE-like LEE
 - However, it cannot fully rule-out the MiniBooNE sterile neutrino allowed regions
 - SBN program with near and far detectors is needed
 - Also, have not examined all final states from possible BSM physics
 - SLAC participates in SBN program through ICARUS experiment
- New (2.9σ) anomaly has appeared in Neutrino-4 reactor ν_e disappearance.



1e1p



1eNp



Inclusive