

Short Baseline Experiment Options/Strategy at Fermilab

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LAGUNA-LBNO General Meeting

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Fermilab Neutrino Program

- Two operating beamlines
 - NuMI (120 GeV proton beam)
 - BNB (8 GeV proton beam)
- Three operating experiments
 - MINOS (NuMI Beam)
 - MINERvA (NuMI Beam)
 - MiniBooNE (BNB)
- Two experiments under construction
 - NOvA (NuMI Beam)
 - MicroBooNE (BNB)
- Project planning is under way for LBNE
 - New neutrino beam
 - 200 kton Water Cherenkov or 34 kton LAr detectors, currently planned to be in Homestake Mine, South Dakota
=> 1300 km baseline.

LBNE Prototype LAr TPC

- If LAr is chosen for LBNE, then a macroscopic engineering prototype is required:
 - To test all specific engineering designs at “full” scale.
 - To test systems issues.

We are eager to start this program soon.
- It is desirable to expose the prototype to a ν beam.
 - But it is not essential, given the planned MicroBooNE program.
 - And it would add substantial cost (and likely time) to put the prototype in a beam.
- It may be desirable to place the prototype underground.
 - Cosmic ray shielding and background measurements.
 - But it would add substantial cost and time.

Interest in Short-Baseline Neutrino Physics

- LSND/MiniBooNE anomalies
- Recently claimed reactor neutrino anomaly
- Could be addressed with new experiment(s) using existing Fermilab beams.

Short-Baseline Neutrino Physics Workshop at Fermilab, 12-14 May 2011:

- Recent experimental results
- Theoretical interpretations
- Future short-baseline beam facilities
- Future short-baseline experiments

Official announcement and website within 1-2 weeks.

Organizers: Bill Louis (louis@lanl.gov)

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Are there Synergies Between the LAr Prototype and Short-Baseline Program?

- Planning is currently under way to determine the required size and characteristics of the LBNE LAr engineering prototype.
- Physics studies required for a possible experiment:
 - to make the case for a new experimental program.
 - to choose appropriate location and characteristics of detector(s) for such experiment(s).
- Will there be a match between these two???