Cambridge Summary

November 2019

The Team

Dr Melissa Uchida (PI)   Dr Leigh Whitehead   Mr Philip Detje

New postdoc joining soon...

- Other group members not actually taking secondments but supporting the work;
  - Alex Moor
  - Andrew Smith
  - Stefano Vergani

Workplan

- WP1:

  - Operation and data taking of the MicroBooNE detector.

  - Performing global analysis across the SBN detectors.

  - Knowledge transfer from experience with the SBN detectors to the next generation of LAr-TPCs (DUNE).

Workplan

- ## WP2:

  - Develop MicroBooNE software and perform data analysis. Optimizing reconstruction codes for neutrino interactions. Measuring EM showers, optimizing Pandora and exploiting Machine Learning techniques.

  - In particular for LEE Analysis.

  - Using the above develop and test SBN data analysis tools.

  - Test Pandora against data from all LArTPC Experiments including ProtoDUNE.

Workplan

- WP3:
  - Perform MicroBooNE neutrino oscillation analysis. In particular LEE analysis.
  - Study low energy neutrino interactions in MicroBooNE and SBND, by measuring differential cross-sections. In particular, CCQE interactions.
  - Study of the systematic uncertainties and use them to inform future experiments.
  - Begin the full (combined with MicroBooNE) SBN data oscillation analysis.
  - DUNE preparation inc. software, event reconstruction and analysis techniques.
  - DUNE design studies.

Secondments

- **WP1**: 4 months/secondments over 4 years
- **WP2**: 6 mnths/secs over 4 years
- **WP3**: 6 mnths/secs over 4 years

- Secondments 2019:
  - Melissa Uchida: 0.5 x WP2.
- Secondments Planned 2020:
  - Philip Detje: 2.5 x WP2.
  - Melissa Uchida: 1 x WP1.
  - Leigh Whitehead: 1 x WP1.