Prof Charle E Lane: IF Fellowship

Proposal Summary

The main goal of this effort is to improve neutrino-beam systematics, and to simulate the effect of propagating improved systematics to the DUNE detectors. The improvement of systematics is being pursued by the use of “stopping muon” counters, to measure and characterize a well-defined energy slice of the neutrino beam, and to use the effective difference in lifetime of mu+ and mu- (caused by nuclear mu- capture) to improve the knowledge of neutrino/anti-neutrino composition of the neutrino beam.

The Drexel group has installed a small prototype stopped muon counter in a NuMI muon alcove as part of this overall program, but this proposal is to further an intense effort to understand the prototype performance, improve its design, and co-ordinate neutrino beam characterization with other NuMI beam experiments at Fermilab.