Contribution ID: **187** Type: **not specified**

Detector physics and event reconstruction at the MicroBooNE experiment.

Wednesday, 6 September 2023 11:00 (20 minutes)

The MicroBooNE experiment is a Liquid Argon Time Projection Chamber (LArTPC) placed on-axis to the Booster Neutrino Beam (BNB) at Fermilab. MicroBooNE ran its physics and R&D runs from 2015 through 2021. Its primary physics goal is to contribute to addressing the elusive short-baseline MiniBooNE low energy excess. MicroBooNE records and utilizes both the ionization charge and scintillation light produced inside the TPC to select and reconstruct its events. To properly address the physics goals, it is crucial to properly understand how the detector evolves over time and perform continuous calibrations. This means performing state of the art measurement of detector physics quantities such as electron lifetime, diffusion, as monitoring and calibrating the light yield. This talk will go over what MicroBooNE has learned and measured throughout its nearly continuous 7 years of running regarding detector physics measurements. Analysis of MicroBooNE performance over time will be beneficial to the next many years long running Short-Baseline Neutrino (SBN) and DUNE programs to properly understand the important detector physics measurements in LArTPCs. Finally, we will present recent developments in LArTPC analysis that demonstrate O(ns) neutrino interaction timing and MeV-scale physics reach employing both charge and scintillation signatures.

Primary author: GRAMELLINI, Elena (University of Manchester)

Presenter: Dr GREEN, Patrick (University of Oxford)

Session Classification: D2