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Electron lifetime measurement using cosmic ray muons at the MicroBooNE LArTPC VARUNA CRISHAN MEDDAGE, Kansas State University, MICROBOONE COLLABORATION — MicroBooNE, a 170 ton liquid argon time projection chamber (LArTPC) located on the Fermilabs Booster Neutrino Beamline (BNB), is designed to both probe neutrino physics phenomena and further develop the LArTPC detector technology. MicroBooNE is the largest currently operating LArTPC detector and began collecting data in Fall 2015. LArTPCs are imaging detectors that offer exceptional capabilities for studying neutrinos. A fundamental requirement for the performance of such detectors is to maintain electronegative contaminants such as oxygen and water at extremely low concentrations, which otherwise can absorb the ionization electrons. The impurity levels in liquid argon can be estimated from the drift electron lifetime as they are inversely proportional to each other. This talk presents a measurement of the drift electron lifetime using cosmic ray muon data collected by MicroBooNE. An interpretation of the observed drift electron lifetime as a function of time indicates that the electron attenuation due to impurities in the liquid argon is negligible during normal operations, implying that the argon purification and gas recirculation system in MicroBooNE is performing successfully.

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