Abstract Submitted
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On Monitoring Purity in Liquid Argon Based Detectors[1] SAMUEL FOGARTY, Colorado State University — Liquid argon is being used as a target for neutrino interactions in current and future large-scale experiments. Charged particles ionize argon atoms in the liquid as they pass through and, in a Liquid Argon Time Projection Chamber (TPC), a strong electric field causes many of the resulting electrons to drift to the anode where they are detected. Electronegative impurities like oxygen and water can attach to the drifting electrons stopping them before they reach the anode. Low purity reduces the quality of reconstructed tracks, thus a dedicated method of measuring purity is essential to know the accuracy and reliability of a detector at any one time. In this talk, a purity monitor system tested by CSU will be discussed. It will measure the purity of liquid argon (electron lifetime) for the CSU 'SingleCube' pixelated TPC. The purity monitor consists of an anode and cathode, an electric field to drift electrons, and a Xenon lamp that causes photo-electrons at a gold plate at the cathode. Current signals from the anode and cathode are sent to a charge integrating amplifier that produces amplified voltage output that can be used to access charge information before and after drifting. The charge information can then be used to provide a measure of purity in a detector.

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