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Identification of $\Lambda \to p\mu^-\bar{\nu}_\mu$ events using particle tracking detectors RAJAN PLUMLEY, MICHAEL MCCRACKEN, Washington & Jefferson College — Study of semi-leptonic hyperon decays could reveal possible disagreements with Standard Model (SM) predictions in which lepton universality (LFU) is presumed. Modern nuclear physics experiments such as CLAS and Glue-X have the capability to produce and reconstruct hyperons, including the Λ baryon, in large numbers, however identification of semi-leptonic decay events such as $\Lambda \to p\mu^-\bar{\nu}_\mu$ is difficult for two reasons. First, the missing momentum carried by the neutrino decreases kinematic constraints. Second, the background of hadronic decay events in which the pion decays via $\pi^- \to \mu^-\bar{\nu}_\mu$ in proximity to the Λ decay vertex necessitates the use of vertexing information. We present a set of techniques, developed in a Monte Carlo-based analysis, for separating small semi-leptonic decay signal from much more prevalent hadronic decay backgrounds. These techniques rely on kinematic observables and, more crucially, tracking and vertexing information. In addition we present a study of signal/background separability and its dependance on a detector's vertexing resolution.

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