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Measuring branching fractions for $\Lambda \to p\ell^-\bar{\nu}$ using CLAS at Jefferson Lab MICHAEL MCCRACKEN, Washington & Jefferson College, REINHARD SCHUMACHER, Carnegie Mellon University, THE CLAS COLLABORATION — Semi-leptonic decays (SLD) of hadrons such as those of the hyperons $Y \to p\ell^-\bar{\nu}$, provide a testing ground for deviations from Standard Model (SM) predictions in which lepton flavor universality (LFU) is presumed. Such decays have been studied since the late 1960s, yet some channels are poorly constrained; *e.g.*, the world dataset for $\Lambda \to p\mu^-\bar{\nu}$ comprises only 28 events. We present the status of a measurement of the branching fractions for the muonic and electronic decays of the Λ using the CLAS detector at Jefferson Laboratory. The dataset contains 1.861×10^6 fully reconstructed $\gamma p \to K^+\Lambda$ events in which the Λ decays via the dominant hadronic mode ($\Lambda \to p\pi^-$). Identification of SLD events is complicated by two factors: by the missing momentum carried by the neutrino, and by hadronic decay events in which the pion decays via $\pi^- \to \mu^-\bar{n}u$ near the Λ decay vertex. We demonstrate that a boosted decision tree analysis based on kinematic and vertexing information is sufficient to separate the SLD events from the dominant backgrounds, and thus decrease experimental uncertainties on the branching fraction for the muonic decay.

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