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Application of Likelihood PID Method in Hypernuclear Experiment E01-011[1] PAVLO BATURIN, JOERG REINHOLD, Florida International University, JEFFERSON LAB E01-011 (HKS) COLLABORATION — JLab experiment E01-011, employed the (e,e'K^+) reaction for a new generation of hypernuclear spectroscopy studies. A new high resolution kaon spectrometer (HKS) together with the newly introduced tilt method for the electron spectrometer (ENGE) allowed to simultaneously achieve excellent energy resolution and significantly reduce background events due to bremsstrahlung and Moller electrons. The energy spectra of exotic neutron rich Λ hypernuclei ($^{7}_{\Lambda}$He, $^{9}_{\Lambda}$Li, $^{12}_{\Lambda}$B, $^{28}_{\Lambda}$Al) were measured with high statistics. Efficient kaon particle identification (PID) is key to obtaining good signal to background ratios. We introduced a method based on probability density functions for independent detector distributions that are combined into likelihood values for each possible particle. The goal is to improve statistical significance, especially for low statistic core excited states that are observed in the excitation spectra. The presentation will illustrate the novel likelihood approach, compare it to standard PID cuts, discuss the method's benefits, and show the effect on the missing mass distributions.

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