

Abstract Submitted
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A new method of background suppression for the hypernucleus study at MAMI YUTA TAKAHASHI, Graduate School of Science, Tohoku University, A1 HYPRENUCLEAR COLLABORATION — We started the hypernuclear decay-pion spectroscopy with electron beam at the MAINZ Microtron MAMI-C since 2011. In this experiment, we measure pion momenta from hypernuclei stopped in the target with a 10^{-4} resolution to determine masses of light hypernuclei with an accuracy of ~ 30 keV. In the previous experiment (2012), we improved the signal to noise ratio by installing a new Pb shield and aerogel Cherenkov detectors in the Kaon spectrometer (Kaos) which tags hyperon generation. We successfully observed a pion peak from two-body weak decay of stopped ${}^4_{\Lambda}\text{H}$, and evaluated B_{Λ} and the mass with an accuracy of ~ 110 keV including both statistical and systematic errors. However, a pion background from the quasi-free hyperon (QFBG) prevented us from observation of other hypernuclei with less yield. Since QFBG cannot be rejected by the K^+ tagging, a new method to suppress QFBG is necessary. The generation positions of the pions from QFBG are mainly distributed out of the target while pions from hypernuclei were generated in the target. Therefore a new tungsten heavy-alloy absorber to stop the pions from QFBG was newly installed for the beam time in May-June 2014. I will present the design principle of the absorber and its performance achieved.

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