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Optimizing the Region of Interest in the KATRIN detector system[1] VICTORIA KUBYSHKO, Carnegie Mellon University, KATRIN COLLABORATION — The KATRIN experiment is currently obtaining data to determine the effective electron neutrino mass with a sensitivity of 0.2 eV/c^2 by precision electron spectroscopy near the endpoint of the β-decay of tritium. The neutrino mass is determined by an integrated spectrum which currently uses a fixed wide region of interest (ROI) cut from the detector's energy spectrum, from 14keV to 32 keV. We expect an energy peak around 28keV, accounting for a 10keV shift from the endpoint energy of 18.6keV. This method discards data from some noisy pixels and shadowed pixels. The goals of this project were to determine the resulting sensitivity of the spectrum when changing the ROI, recommend a method to obtain the best suited ROI, and salvage the data from unused pixels using data from the first tritium runs. Some factors we have considered are background noise, shifting of the peak due to changing potentials, and nonuniformities among pixels. This resulted in the comparison of various ROI cuts to the one currently used.

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