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Evaluation of the KATRIN Detector[1] KEVIN WIERMAN, KATRIN Collaboration, University of Washington Team — The KArlsruhe TRItium Neutrino experiment, (KATRIN), is designed to make a direct, model independent measurement of the electron neutrino mass with a sensitivity of .2 eV. A neutrino mass measurement will guide theory beyond the current Standard Model, which considers neutrinos to be massless, as well as modern cosmological models. KATRIN determines the neutrino mass by using magnetic adiabatic collimation and an electrostatic retarding spectrometer coupled to a 148 pixel PIN diode array to analyze the spectrum of electrons emitted during tritium beta decay. In addition to basic counting, the energy, spatial and temporal resolutions of the detector will be used to reduce systematic error. The detector performance was characterized using an ^{241}Am gamma source and a mono-energetic photoelectron source. The response to the electron source was used to monitor the thickness of the non-reactive dead-layer of the detector. The absolute detector efficiency is monitored to the 1% level by comparing a femto amp photocurrent source to the electron rate in the detector. By March 2011, the system will be available for use in commissioning the rest of the KATRIN hardware in Karlsruhe, Germany.

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