
Contribution ID: **180** Type: **Poster**

# Methods for active background removal in the KATRIN experiment

The KATRIN experiment will measure the mass of the electron-antineutrino with a sensitivity of 200 meV/c^2 (90% C.L.) by determining the electron energy spectrum of the Tritium beta-decay in the end-point region. To reach this sensitivity, an ultra-low background level of < 0.01 counts per second is mandatory. The energy analysis of the decay electrons is achieved by an electrostatic spectrometer which follows the principle of the MAC-E filter.

While cooling down via ionization of residual gas molecules, stored electrons produce hundreds of secondary electrons, which can reach the detector and contribute to background in the signal region. In order to suppress this background component, several active methods are investigated to remove stored electrons, such as the application of an electric dipole field and the application of magnetic pulses inside the main spectrometer.

This poster presentation introduces the theory of background production mechanisms due to stored electrons and the removal by active methods in the main spectrometer. In context of the spectrometer- and detector-commissioning phase in summer 2013, the poster will also summarize first measurement results from the application of both active methods.

This work was supported by the BMBF under grant no. 05A11VK3 and by the Helmholtz Association.

**Primary authors:** Mr HILK, Daniel (Karlsruhe Institute of Technology, Germany); Mr BEHRENS, Jan David (University of Muenster (WWU))

**Presenters:** Mr HILK, Daniel (Karlsruhe Institute of Technology, Germany); Mr BEHRENS, Jan David (University of Muenster (WWU))

**Track Classification:** Neutrino Mass