Contribution ID: **60** Type: **Parallel session talk**

Status of the KATRIN experiment

Saturday, July 23, 2011 9:55 AM (15 minutes)

The KATRIN experiment is the next generation tritium beta decay experiment which aims for a direct, model-independent measurement of the electron neutrino mass with 200 meV/c^2 sensitivity (90% C.L.). This corresponds to an improvement of the sensitivity by one order of magnitude in comparison to current results of tritium beta decay neutrino mass experiments. KATRIN uses a high-luminosity windowless gaseous tritium source, a superconducting electron transport and tritium retention section, two spectrometers working as electrostatic filters and a detector section to measure the integrated beta electron energy spectrum.
In order to reach the design sensitivity of KATRIN, the tritium source needs a high activity (10^11 Bq) and the main source parameters (Temperature, gas inlet, isotopic purity) have to be stabilized to the 10^-3 level. The transport and retention section adiabatically guides the electrons from the source to the spectrometers while reducing the tritium flow rate by 14 orders of magnitude. The electrostatic spectrometers are based on the MAC-E principle and act as a high pass energy filter with 0.93 eV energy resolution at 18.6 keV retarding voltage. Electrons with high enough energy to pass the MAC-E filters are detected by a detector system with < 1 mHz background rate.
The KATRIN experiment is currently being setup at the Karlsruhe Institute of Technology (KIT). An overview of the experiment and the status of the commissioning of the mayor components will be given.
We acknowledge the BMBF Verbundsforschung and the DFG SFB/TR27 for partly funding this work.

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Session Classification: Neutrino Physics

Track Classification: Neutrino Physics