Poster session 1 - Monday 4 July

P1.049 **Background processes in the KATRIN main spectrometer**

F Fraenkle

Karlsruhe Institute of Technology (KIT), Germany

on behalf of KATRIN collaboration

The KArlsruhe TRItium Neutrino (KATRIN) experiment is a large-scale experiment for the model independent determination of the effective mass of electron anti-neutrinos with a sensitivity of 200 meV/c^2. It investigates the kinematics of electrons from tritium beta decay close to the endpoint of the energy spectrum. Low statistics at the endpoint requires an equally low background rate below 0.01 counts per second. The measurement setup consists of a high luminosity windowless gaseous molecular tritium source (WGTS), a differential and cryogenic pumped electron transport and tritium retention section, a tandem spectrometer section (pre-spectrometer and main spectrometer) for energy analysis, followed by a detector system for counting transmitted beta decay electrons.

The background characteristics of the KATRIN main spectrometer were investigated in detail during two commissioning measurement phases. Of particular interest were backgrounds due to the decay of radon in the volume of the spectrometer, cosmic muon induced backgrounds, backgrounds due to natural radioactivity and Penning discharge related backgrounds. This poster will present results of the commissioning measurements and focuses on different background processes and their contribution to the overall background of the KATRIN experiment.