Poster session 1 - Monday 4 July

P1.051 **The Windowless Gaseous Tritium Source (WGTS) for the KATRIN experiment**

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The Karlsruhe Tritium Neutrino Experiment (KATRIN) will perform a direct, kinematics-based measurement of the neutrino mass with a sensitivity of 200 meV (90 % C. L.) reached after 3 years of measurement time. The neutrino mass is obtained by investigating the shape of the spectrum of tritium β decay electrons close to the endpoint at 18.6 keV with a spectrometer of MAC-E filter type. To achieve the targeted sensitivity, the systematic uncertainties of this measurement have to be carefully controlled. The main systematic effects are linked to the source and transport section (STS) of KATRIN, especially to the Windowless Gaseous Tritium Source (WGTS).

This contribution reviews the source-related systematics together with experimental measures to minimize and evaluate these instrumental effects. As an example, the energy loss of signal electrons due to scattering on gas molecules inside the WGTS, forming one of the major systematic uncertainties, is addressed. Furthermore, a comprehensive pseudo-3D gas dynamics model allows to take into account the influence of density and velocity distribution of tritium molecules in the modelling of the beta spectrum. As an input for the gas dynamics model, extensive sensor data (e.g. temperature, magnetic fields) from the source cryostat will be used.

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