Contribution ID: **37** Type: **b**

Operation of the KATRIN molecular tritium source

Wednesday, May 24, 2023 10:10 AM (25 minutes)

The objective of the KArlsruhe TRItium Neutrino (KATRIN) experiment is the direct measurement of the effective mass of the electron antineutrino with an expected sensitivity of 0.2 eV/c² (90% CL) on the neutrino mass. As β-particle source KATRIN uses molecular tritium which decays in a "Windowless Gaseous Tritium Source"(WGTS). This kind of source consists of a gas dynamic system with a source tube of 90 mm in diameter and 10 m in length. The source tube is placed in a magnetic field of approx. 3 T and is pumped with differential pumping stages at both ends. In total, 26 turbomolecular pumps (TMP) are continuously operated within the KATRIN tritium handling system (loop system). After pumping down by the TMP's and compressing to approx. 250 hPa by the transfer pumps, the tritium is purified with a palladium membrane filter and re-injected into the middle of the source tube ("closed loop operation").
This talk will give an overview over the KATRIN tritium system, its commissioning and the measurement phases so far culminating in a total throughput of 22 kg over the WGTS.

Author: Dr STURM, Michael (IAP-TLK)

Presenter: Dr STURM, Michael (IAP-TLK)

Session Classification: Neutrino physics with Tritium and atomic sources

Track Classification: Oral presentations