International Workshop on Baryon and Lepton Number Violation (BLV 2024)



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Probing the Neutrino Mass and Beyond with the KATRIN Experiment (17'+3')

Wednesday, October 9, 2024 2:55 PM (20 minutes)

The Karlsruhe Tritium Neutrino (KATRIN) experiment aims to measure the effective electron antineutrino mass using ultra-high precision spectroscopy of tritium β -decay in the kinematic endpoint region. The most stringent upper limit on the neutrino mass was recently placed at $m_{\nu}c^2 < 0.45 \text{ eV}$ (90 % CL), using a fraction of the final dataset and improved operational conditions.

Processes that impact the decay kinematics or alter the interaction structure can cause spectral features beyond the neutrino mass. KATRIN investigates new physics scenarios such as mixing with an eV-scale sterile neutrino, the capture of cosmic relic neutrinos on tritium nuclei, and signatures of Lorentz-invariance violation. Additionally, the experiment probes non-standard interactions contributing in the decay structure and explores the coupling of eV-scale BSM bosons to the final state leptons.

This talk will review the latest result of KATRIN and present a selection of the aforementioned searches beyond the neutrino mass.

Presenter: LAUER, Joscha (KIT) **Session Classification:** Neutrino physics