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KATRIN Neutrino Mass Analysis With the Covariance Matrix Approach

The Karlsruhe TRitium Neutrino (KATRIN) experiment is designed to determine the effective mass of the electron-antineutrino with a target sensitivity of 200 meV/c² (90% C.L.) in a direct and model-independent way. KATRIN uses a strong gaseous windowless Tritium source associated with a large high-resolution spectrometer (MAC-E filter) to analyze precisely the electron energies from the source. The neutrino mass can be inferred from the shape of the tritium β -decay spectrum in the endpoint region. After global commissioning of the apparatus with Tritium in 2018, KATRIN started its first neutrino mass measurement campaign in spring 2019. This talk presents the first neutrino mass results, including an analysis of stability and systematics effects based on the covariance matrix approach, using the Samak simulation analysis package. New analysis developments for the forthcoming KATRIN data will be presented.

Mini-abstract

First KATRIN neutrino mass result and analysis developments for forthcoming KATRIN data.

Experiment/Collaboration

KATRIN

Primary authors: Ms SCHLÜTER, Lisa (Max Planck Institute for Physics); Dr LASSERRE, thierry (CEA)

Presenter: Ms SCHLÜTER, Lisa (Max Planck Institute for Physics)

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