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The KATRIN Neutrino Mass Experiment

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The Karlsruhe Tritium Neutrino (KATRIN) Experiment aims to measure the neutrino mass using tritium beta decays. KATRIN will carefully determine the shape of the tritium beta-decay spectrum near the endpoint. After collecting three years of data, KATRIN will be able to discover a neutrino mass as small as 350-meV (5σ), or place an upper limit at 200-meV (90% CL). The experiment is currently under construction and commissioning at the Karlsruhe Institute of Technology. The main components of the experiment include a windowless, gaseous tritium source, differential and cryogenic pumping to remove the tritium gas, two spectrometers, and a silicon PIN diode detector. The tritium source and pumping sections are currently under construction. KATRIN's spectrometers act as precision high-pass energy filters, using the technique of magnetic adiabatic collimation with an electrostatic retarding potential to precisely remove low-energy electrons. The main spectrometer and the silicon detector are undergoing extensive testing to allow us to fully understand the electron transmission properties. This talk will present the current status of KATRIN construction and commissioning activities.

Summary

Primary author(s) : Dr. OBLATH, Noah (Massachusetts Institute of Technology)

Presenter(s) : Dr. OBLATH, Noah (Massachusetts Institute of Technology)

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