

Search for keV-scale sterile Neutrinos with the first Light of KATRIN

A sterile neutrino with a mass up to 18.6 keV would be visible in the beta-decay spectrum of tritium. The KATRIN experiment is designed to determine the absolute neutrinos mass by measuring the beta-decay spectrum of gaseous tritium close to its endpoint. Beyond that, it's unprecedented tritium source luminosity and spectroscopic quality could be used to measure the entire beta-spectrum to search for a sterile neutrino. The idea presented on this poster is the so-called Phase-0 measurement, where the first light data of KATRIN would be used to scan the entire tritium beta-decay spectrum to search for sterile neutrinos. A measurement of only one week with KATRIN has the potential to improve the current laboratory limits for keV-scale sterile neutrinos. This work presents the expected sensitivity, important systematic effects and the experimental realization of this measurement.

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Authorship annotation

Anton Huber for the KATRIN collaboration

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