

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

Authorship annotation

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Session and Location

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Abstract content

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, its 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. This work was supported by GRK1694, BMBF (05A17VK2), KSETA, the HGF and the Friedrich-Ebert-Stiftung.

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