

A model for a keV-scale sterile neutrino search with KATRIN: SSC-sterile

Authorship annotation

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Monday Session, Poster Wall #133 (Hölderlin-Room)

Abstract content

The KATRIN experiment can perform a comparably low-statistics search for keV-scale sterile neutrinos with the first tritium measurements, improving the current laboratory limits on the squared sterile-to-active mixing angle by about one order of magnitude. For the keV-scale sterile neutrino search a wider energy range of tritium β -decay spectrum has to be measured, as the “postulated” neutrinos would manifest themselves as a kink in the spectrum at an a priori unknown energy.

For this reason a precise model of the entire spectrum is necessary. In this poster we present a novel technique to simulate the full spectrum, taking into account experimental effect appearing in KATRIN-like experiments. The model is constructed from the responses of each individual experimental component: the tritium source, the spectrometer and the detector. The influence of systematic uncertainties is discussed.

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Primary author(s) : Dr. SLEZÁK, Martin (Max Planck Institute for Physics); Dr. LOKHOV, Alexey (Institute for Nuclear Research RAS)

Co-author(s) : Dr. MERTENS, Susanne (MPP & TUM); ROCCATI, Federico (MPP & TUM); STEVEN, Madlen (MPP & TUM); KÖLLENBERGER, Leonard (KIT); HUBER, Anton (KIT); FÖRSTNER, Ellen (KIT); KORZECZEK, Marc (KIT)

Presenter(s) : Dr. SLEZÁK, Martin (Max Planck Institute for Physics); Dr. LOKHOV, Alexey (Institute for Nuclear Research RAS)

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