

Search for new light bosons with the KATRIN experiment

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The Karlsruhe Tritium Neutrino (KATRIN) experiment is designed to measure the effective electron antineutrino mass with a sensitivity better than $m_\nu c^2 = 0.3$ eV (90% C.L.) using precision electron spectroscopy of tritium beta decay. This determination occurs in the spectral endpoint (E_0) region, up to some 10 eV below $E_0 \approx 18.6$ keV.

Light neutral pseudoscalars and vector bosons arise in many theories beyond the Standard Model (BSM). High-statistics beta spectroscopy with KATRIN is a complementary probe for these new physics theories regarding coupling strengths of bosons to neutrinos or electrons.

The measured beta spectrum is characteristically distorted due to the emission of an additional boson in the decay as described in JHEP 01 (2019) 206. We present the sensitivity estimates of the second measurement campaign (4×10^6 electrons in the ROI of $[-40, +130]$ eV around E_0) to such light boson couplings.

Alternate track

I read the instructions above

Yes

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