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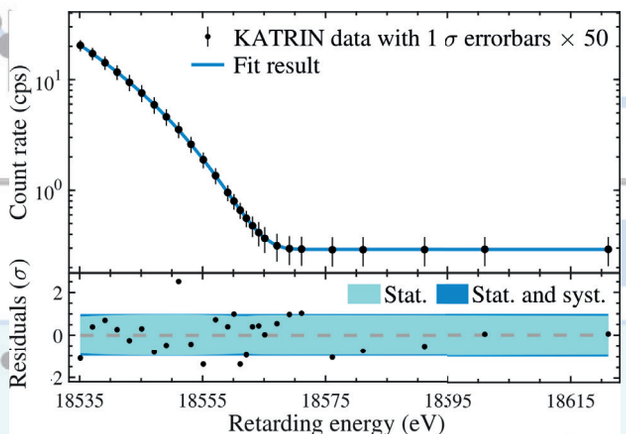

First neutrino mass results from KATRIN

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Since the discovery of neutrino oscillation we know that neutrinos have non-zero masses, but we do not know the absolute neutrino mass scale, which is as important for cosmology as for particle physics. The direct search for a non-zero neutrino mass from endpoint spectra of weak decays is complementary to the search for neutrinoless double beta-decay and analyses of cosmological data. Today the most stringent direct limits on the neutrino mass originate from investigations of the electron energy spectra of tritium beta-decay. The next generation experiment KATRIN, the Karlsruhe Tritium Neutrino experiment, is improving the sensitivity from the tritium beta decay experiments at Mainz and Troitsk of 2 eV/c^2 by one order of magnitude probing the region relevant for structure formation in the universe. KATRIN uses a strong windowless gaseous molecular tritium source combined with a huge MAC-E-Filter as electron spectrometer. To achieve the sensitivity, KATRIN has been putting many technologies at their limits. The full 70m long setup has been successfully commissioned. From early 2019 on KATRIN is taking high statistics tritium data hunting for the neutrino mass. In this talk an introduction into the necessity to determine the neutrino mass and the status in the field will be given, followed by a detailed presentation of KATRIN and its results from the first KATRIN science run. The new results are already bringing KATRIN into the lead position of the field. In the outlook the perspectives of KATRIN for the coming years and new technologies to potentially improve further the sensitivity on the neutrino mass will be briefly discussed.

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