

Potential to constrain the relic neutrino background with KATRIN

The Karlsruhe TRitium Neutrino (KATRIN) experiment - currently in its final construction and commissioning phase at the Karlsruhe Institute of Technology (KIT) - will determine the neutrino mass with an unprecedented sensitivity of 200 meV at 90% C.L. by high-precision tritium beta-decay spectroscopy. Its unique high-intensity tritium source opens up the possibility to search for the elusive relic neutrinos via the process of neutrino capture. Here, we report the potential of KATRIN to probe the relic neutrino density in the form of a local overdensity relative to the average relic neutrino density in the universe.

Current estimates show that KATRIN will be able to set a limit on the local relic neutrino overdensity of the order 10^9 .

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