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P4.041 A Pre-KATRIN search for keV-scale sterile neutrinos

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Sterile neutrinos in the keV-mass range are a viable dark matter candidate. A sterile neutrino with a mass up to 18.6 keV would be visible in the beta-decay spectrum of tritium as a kink-like signature and distortion. The KATRIN experiment, which is commissioned at the moment, is designed to determine the absolute neutrinos mass by measuring the beta-decay spectrum of gaseous tritium close to its endpoint. Beyond that, the many outstanding features of the experiment could be used to measure the entire beta-spectrum to search for a kinklike signature of a sterile neutrino. The idea which is shown in the proposed poster is a so-called PreKATRIN 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 poster presents the expected sensitivity, important systematic effects and the experimental realization of this experiment. We like to remark, that this work has been supported by the German BMBF (05A14VK2), by the Ministry of Science, Research and the Arts, Baden- Wuerttemberg (MWK), by the CEA and the Deutschlandstipendium (BMBF and SAP SE).