Contribution ID: **223** Type: **poster**

TRISTAN: A novel detector for searching keV-sterile neutrinos at the KATRIN experiment

Wednesday, September 15, 2021 10:23 AM (1 minute)

The KATRIN (Karlsruhe Tritium Neutrino) experiment investigates the kinematic endpoint of the tritium β-decay spectrum to determine the effective mass of the electron anti-neutrino. The collaboration reported its first neutrino mass result in fall 2019: $m < 1.1$ eV (90% CL). Its unprecedented tritium source luminosity and spectroscopic quality make it a unique instrument to also search for physics beyond the standard model such as sterile neutrinos.

Therefore, we develop a new detector for the KATRIN experiment to detect the signature of a sterile neutrino in the keV mass regime. In order to obtain a high sensitivity to the sterile neutrino mixing angle, excellent spectroscopic properties at high rates are essential. The novel TRISTAN detector system will exploit the silicon drift detector technology, which meets these requirements due to its small anode capacitance of less than 200 fF, and scale this technology to a large array of more than 3000 pixels.

This poster will present the design and status of the new detector, where we recently reached an important milestone by operating one 47-pixel detector module. A special focus will be put on the characterization of inter-pixel effects, which play an important role in the highly integrated multi-pixel detector system.

Title

Mr

Your name

Korbinian Urban

Institute

Max Planck Institute for Physics, Föhringer Ring 6, D-80805 Munich, Germany

email

kurban@mpp.mpg.de

Nationality

german

Primary author: URBAN, Korbinian (Max-Planck-Institut für Physik, Föhringer Ring 6, D-80805 München, Germany; Physik-Department, Technische Universität München, D-85747 Garching, Germany)

Presenter: URBAN, Korbinian (Max-Planck-Institut für Physik, Föhringer Ring 6, D-80805 München, Germany; Physik-Department, Technische Universität München, D-85747 Garching, Germany)

Session Classification: Posters Session 1 (Applications in Astro-particle Physics; Applications in Astronomy, Planetary and Space Science; Applications in Life Sciences and Biology)

Track Classification: Applications in Astro-particle Physics