

Development of a silicon drift detector system for the TRISTAN project

Sterile neutrinos are a minimal extension of the Standard Model of Particle Physics. If their mass is in the kilo-electron-volt regime, they are viable dark matter candidates. One way to search for sterile neutrinos in a laboratory-based experiment is via tritium beta decay, where the new neutrino mass eigenstate would manifest itself as a kink-like distortion of the spectrum. The objective of the TRISTAN project is to extend the KATRIN setup with a novel multi-pixel silicon drift detector system to search for a keV-scale sterile neutrino signal. First seven-pixel prototype detectors were produced and characterized with radioactive x-ray and electron sources. The next prototype generation with 166 pixels is currently in production and will be available at the end of 2018.

This poster describes the requirements of the novel TRISTAN detector system and presents the technical realization of the first prototypes.

Authorship annotation

for the KATRIN collaboration

Session and Location

Monday Session, Poster Wall #144 (Hölderlin-Room)

Poster included in proceedings:

yes

Primary author: Mr BRUNST, Tim (Max Planck Institute for Physics)

Co-authors: SIEGMANN, Daniel (Max Planck Institute for Physics); ALTENMÜLLER, Konrad (Technical University Munich); MERTENS, Susanne (Max Planck Institute for Physics)

Presenter: Mr BRUNST, Tim (Max Planck Institute for Physics)

Track Classification: Poster (participating in poster prize competition)