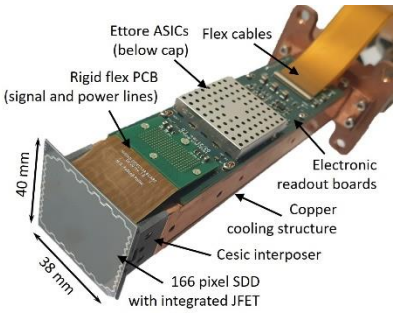
Karlsruher Institut für Technologie

Master thesis
at the Institute for Astroparticle physics (IAP)

Tristan

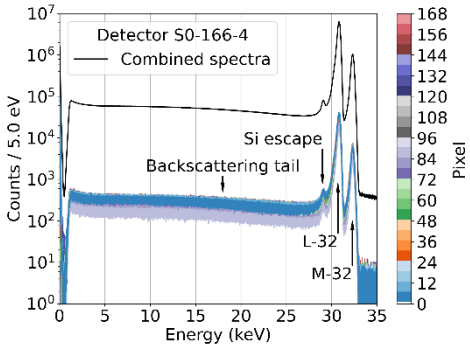


TRISTAN-Krypton-83m measurements with the monitor spectrometer: Line- and shape parameter fitting

Description and task of the work: For the upcoming TRISTAN measurements (2026) for the search of sterile neutrinos with tritium, calibration measurements with gaseous Krypton-83m will be mandatory. For detailed understanding of the line position and shape parameters of the various conversion electrons using a differential detector, measurements with a solid Rb/Kr source can be performed at the Monitor spectrometer (MoS).
This thesis combines hardware work at the MoS regarding Ultra-high-vacuum (UHV), superconducting magnets and radioactive sources with measurements and analysis of data taken with a TRISTAN 166 pixel detector module and simulations of the MoS with implementation of the detector geometry in Kassiopeia.

The basic topics of the work are:

- Operation of a KATRIN-like spectrometer
- Data acquisition with the latest technology silicon drift detector
- Take over design in Kassiopeia simulations



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Start: around May 2024

The work is carried out at the IAP on the north campus.