Contribution ID: **154** Type: **Poster**

A model for the KATRIN differential Tritium spectrum to search for keV sterile neutrinos

Monday 28 August 2023 18:42 (1 minute)

KATRIN (Karlsruhe Tritium Neutrino Experiment) aims to measure the neutrino mass by analyzing the end-point region of a Tritium spectrum using a high-luminosity source and a high-resolution MAC-E filter technique. KATRIN holds the current best limit on the neutrino mass of 0.8 eV, coming from the joint analysis of the first two measurement campaigns.
After KATRIN's data taking, a detector upgrade, called TRISTAN, is planned. The choice for this new detector is a matrix of Silicon Drift Detectors (SDDs) made of 9 modules with 166 pixels each.
KATRIN, equipped with the TRISTAN detector, has the potential to perform a high-statistics differential measurement deep into the Tritium β spectrum and thus enable the search for sterile neutrinos in the keV-range, candidates to be Dark Matter particles. The existence of these particles would lead to a kink in the β spectrum. In order to search for this small signature an accurate model of the whole spectrum is needed. In particular, keV electrons can lose part of their energy by interacting with several elements of the beamline, leading to spectral distortions.
In this poster, I will provide an overview of the status and the challenges of a model for the whole Tritium differential spectrum.

Submitted on behalf of a Collaboration?

Yes

Primary author: NAVA, Andrea (University of Milano-Bicocca, INFN section Milano-Bicocca (Italy))

Presenter: NAVA, Andrea (University of Milano-Bicocca, INFN section Milano-Bicocca (Italy))

Session Classification: Poster session

Track Classification: Neutrino physics and astrophysics