

High Voltage Monitoring and Characterization at KATRIN

The Karlsruhe Tritium Neutrino (KATRIN) experiment aims to measure the effective electron-antineutrino mass with a sensitivity of $0.2 \text{ eV}/c^2$ (90% C.L.). This is achieved by measuring the tritium beta spectrum in the endpoint region using an integrating spectrometer. For this, the voltage needed to create the integrating spectrometer's electrostatic energy barrier must be precisely set and known. KATRIN's high voltage system meets these requirements with precision power supplies and high precision monitoring using purpose-built high voltage dividers. The influence of the mains frequency coupling to the voltage is investigated using a grid synchronization box. An active post regulation system is in place to compensate voltage instabilities for frequencies up to 1 MHz, thereby suppressing any 50 Hz power-grid interference. Analysis of these effects and their active compensation during measurements will be presented. This work is supported by HGF, BMBF, and DOE.

Authorship annotation

for the KATRIN collaboration

Session and Location

Monday Session, Poster Wall #12 (Robert-Schumann-Room)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)