

Contribution ID: 1014

Type: Poster

Geant4 Simulations of Geometry Factor and Interaction and Energy Losses for TIGERISS

The Trans-Iron Galactic Element Recorder for the International Space Station (TIGERISS) is an ultra-heavy galactic cosmic ray (UHGCR) detector planned for installation at the Columbus SOX location of the International Space Station (ISS) in 2027. TIGERISS will improve on previous instruments by using silicon strip detectors (SSDs) to achieve greater linearity in signal response over an expanded dynamic range 5B and 82Pb and silicon photomultipliers (SiPMs) for a more compact readout profile and to avoid the need for a high voltage. A Geant4-based instrument simulation has been useful in the design phase and in predicting instrument performance and various measurement corrections. Studies performed include a calculation of the top-of-instrument survival fraction corrections by element and incident angle, ionization energy loss simulations with a specific focus on the energy needed to be above threshold in the acrylic (325 MeV/Nuc) and silica aerogel (2.34 GeV/Nuc) Cherenkov detectors by element and incident angle. Additional studies focus on the instrument geometry factor, accounting for possible obstructions present in the instrument field of view on the ISS, as well as simulations of instrument response to isotopes and energies in preparation for a planned beam test at Brookhaven National Laboratory NASA Space Research Laboratory facility.

Collaboration(s)

TIGERISS

Author: LABRADOR, William

Co-authors: RAUCH, Brian; NUTTER, Scott Lowry (NKU - Northern Kentucky University (US)); ZOBER, Wolfgang

Presenter: LABRADOR, William

Session Classification: PO-1

Track Classification: Cosmic-Ray Direct & Acceleration