



## **Simulations of the response of Energetic Particle Experiment of the *Turbulence Heating ObserveR***

Rami Vainio (1), Robert F. Wimmer-Schweingruber (2), Jan Steinhagen (2), Arttu Punkkinen (1), Stephan I. Böttcher (2), Björn Schuster (2), Lars Seimetz (2), Eino Valtonen (1), and Pasi Virtanen (1)

(1) University of Turku, Department of Physics and Astronomy, Turku, Finland (rami.vainio@utu.fi), (2) University of Kiel, Institut für Experimentelle und Angewandte Physik, Kiel, Germany

The Energetic Particle Experiment (EPE) onboard the *Turbulence Heating ObserveR* (THOR – a candidate mission selected by ESA for study phase towards its fourth M-class launch in 2026) is a solid-state detector telescope capable of observing energetic electrons (nominally 20–600 keV) and ions (20–8000 keV/nuc) with some composition measurement capabilities. We have constructed a *Geant4* Monte Carlo model of EPE based on the preliminary design of the instrument. We have performed a study on its response to energetic electrons and ions of different species and energies and evaluated its performance against the science requirements of the THOR mission. We will report the first results of the simulations on the capability of EPE to separate species (electrons from ions and different ion species from each other), on its energy and angular resolution in the nominal energy range, and on its performance outside the nominal energy range. We will also discuss possible ways to improve the design based on these results.