The GEANT4 simulation of PKU Solar Electron and Ions Telescope

Xiangqian Yu, Xin Huang, Linghua Wang, Weihong Shi, Yongfu Wang, Haobo Fu, and Zixuan Liu
(yuxiangqian@pku.edu.cn)

The Solar Electron and Ion Telescope (SEIT), proposed by Peking University for a L1 non-spinning spacecraft mission, is designed to provide Omni-directional investigation of Solar energetic electrons and ions with good time, energy and angular resolution. SEIT consists of multi group two dual double-ended magnet/foil particle telescopes which cleanly separate and measure electrons in the energy range from 50–400 keV and ions from 60–7000 keV expected to be including protons, C and O. The multi group particle telescopes can cover the Omni-directional space. Each two dual double-ended magnet/foil particle telescopes set-up refers to the detector stack with view cones in two opposite directions: one side (electron side) is consisted of a 300um and a 500um Silicon detector whose distance is only 100um to chive a high performance, the 300um Silicon is on the front and covered by a 5um thin parylene foil to leave the electron spectrum essentially unchanged but stops low energy ions, the other side (Ions side) is consisted of a 100um and a 500um Silicon detector whose distance is only 100um to chive a high performance and the front of the telescope is surrounded by a magnet to sweep away electrons but lets ions pass. The dead layer of the detector is only 100 Å and each detector is divided into five pixels to chive a high angular resolution. The time resolution is 1s. Simulation shows that the maximum counts of the 20 pixels can reach to 2452, while the minimum energy deposition of the 20 pixels is 300 keV. We now describe the design and GEANT4 simulation of SEIT.