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4. High energy cosmic rays (HE-CR I)

GEANT 4 simulation of the Helios cosmic ray telescope E6

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In October 2011, ESA announced the selection of Solar Orbiter as one of the Cosmic Vision M missions, with the launch envisioned for 2017. Thus, we will have again in 2020, 40 years after the pioneering Helios mission, a spacecraft that determines in-situ the properties and dynamics of plasma, fields and particles in the inner heliosphere. In contrast to the two Helios spacecraft Solar Orbiter is equipped with sophisticated remote sensing instrumentation. However, we have to realize that due to the different design of the two missions, Solar Orbiter is a three-axis stabilized and the two Helios are spinning spacecraft, Solar Orbiter will not surpass Helios results in all respects, e.g. the energetic particle telescopes can only determine the particle intensities for a limited range of pitch-angle directions. Therefore it is worthwhile to revisit the energetic particle measurements together with the solar wind and magnetic field data from Helios in light of better theoretical understanding and advanced analysis and modeling techniques developed during the past 20 years. In this contribution we will present a GEANT 4 simulation of the response function of the Helios E6 experiment, that measured electrons in the energy range from a few 100 keV to above 10 MeV, ions from 1 MeV/nucleon to above 50 MeV/nucleon, and its application to the data analysis for a selected number of solar energetic particle events.