

Modeling of the Earth atmosphere specific yield function

Wednesday, 27 July 2022 14:15 (15 minutes)

This work represents the research related to the modeling of cosmic rays propagation through the Earth atmosphere and calculation of the specific yield function in form of ionization profiles at different depths (altitudes). The simulation have been performed with the Monte-Carlo based GEANT4 software development toolkit, which includes the cascade models, the neutron interaction databases, and the low-energy electromagnetic interaction database. To model the entire atmosphere from the sea level to the 100 km altitude the NRLMSISE-00 model is used. Both comparison with the previous studies and the verification with an experimental data are given. The results are given in form of the Earth atmosphere ionization yield function datasets. They are presented in the table form, which allows one to quantify the ionization induced by cosmic ray particles for given geographic coordinates, altitude, and the initial energy spectrum of the cosmic ray source. The relevance of this research is due to the global interest in assessing the impact of space weather both on the whole Earth's environment and on the individual objects located in it.

Primary authors: MISHEV, Alexander (University of Oulu); MAURCHEV, Evgenii

Presenter: MAURCHEV, Evgenii

Session Classification: Parallel 2

Track Classification: GEO