Contribution ID: **103** Type: **Zamestnanci fyzika**

Geant4 simulation of geomagnetic field

Wednesday, November 26, 2025 3:38 PM (1 minute)

Modern experimental techniques, such as Accelerator Mass Spectrometry (AMS), allow us to analyze environmental samples with high sensitivity and resolution. The concentration of cosmogenic nuclides in these samples is the result of the interplay between three processes: production, transport, and deposition. The knowledge of involved processes and their simulations allowed us to obtain production rates of various cosmogenic nuclides. The Monte-Carlo method is a very helpful method to understand and simulate such processes. Our model of extraterrestrial production of cosmogenic nuclide was described in [1]. This model could be used also for simulation of cosmic rays' irradiation of extraterrestrial and also terrestrial objects. Cosmic rays impacting at the Earth highly depends on modulation with a geomagnetic field. The field simulation is not included in our model yet. This presentation will be dedicated to the description of improved modelling of geomagnetic field effects in our model. Geant4 toolkit is suited to simulation of simple magnetics field. On the other hand, the geomagnetic field is highly non-uniform. Modeling non-uniforms field is possible by definition of many small uniform fields in Geant4. The global field will be modeled using Geant4 routines. The results will be compared with existing published works and existing experimental data. The extension of our model allows the investigation of Earth samples.

[1] Čechvala, P., Breier, R. & Masarik, J. Production rates of cosmogenic nuclides in extraterrestrial material using GEANT4 software. J Radioanal Nucl Chem 332, 4403–4411 (2023). https://doi.org/10.1007/s10967-023-09135-5

Pracovisko fakulty (katedra)/ Department of Faculty

KJFB

Tlač postru/ Print poster

Budem požadovať tlač /I hereby required to print the poster in faculty

Authors: Prof. MASARIK, Jozef (Comenius University (SK)); BREIER, Robert (Comenius university, Bratislava (SK))

Session Classification: Poster session + káva: prezentácie vedeckých výsledkov FMFI UK Zamestnanci Fyzika

Track Classification: Poster session + káva: prezentácie vedeckých výsledkov FMFI UK Zamestnanci: Poster session + káva: prezentácie vedeckých výsledkov FMFI UK Zamestnanci Fyzika