Determination of Galactic and Anomalous Cosmic Ray Spectra depending on the Solar Activity

M. Buchvarova (1), P. Velinov (2)

(1) Space Research Institute, BAS, 6 Moskovska Str., Sofia 1000, Bulgaria (Email: marusjab@space.bas.bg), (2) Central Laboratory for Solar-Terrestrial Influences, Acad. G. Bonchev Str., bl.3, Sofia 1113, Bulgaria

We propose a model, which generalizes the differential D(E) and integral D($>$E) spectra of galactic (GCR) and anomalous cosmic ray (ACR) protons during the 11-year solar cycle. The model takes into account the cosmic ray (CR) modulation by the solar wind. The model solutions are numerically compared with IMAX and CAPRICE experiments, BESS measurements, and the data from IMP-8. We describe the connection between solar activity variation and the values of received model parameters by taking into account the transport processes: diffusion, convection, drifts and energy changes. This computed analytical model gives a practical possibility for investigation of experimental data from measurements of galactic cosmic rays and their anomalous component. We discuss the errors in the predictions of the model and we compute the limits on estimated model parameters. Formula for the profiles of ionization in the ionosphere and middle atmosphere is given.