

On the relationship of the rigidity spectrum of galactic cosmic rays variations and the interplanetary magnetic field turbulence

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The temporal changes of the rigidity spectrum of the galactic cosmic rays (GCR) intensity variations and the structure of the interplanetary magnetic field turbulence have been studied using data of neutron monitors and the B_x , B_y , B_z components of the interplanetary magnetic field (IMF) for four ascending and descending epochs of solar activity (1960-2002). The rigidity spectrum of the GCR intensity variations is harder in the minima epoch than in the maxima epoch for all the ascending and descending epochs of solar activity. The exponent of the power spectral density of the IMF turbulence increases when the rigidity spectrum of the GCR intensity variations is hard and decreases when it is soft. There is not found any significant distinction in the behavior of the temporal changes of the rigidity spectrum in the difference polarity periods of the Sun's global magnetic field. It is concluded that the changes in the energy range of the interplanetary magnetic field turbulence during the 11-year cycles of solar activity is the general reason of the temporal changes of rigidity spectrum of the GCR intensity.