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Investigations of Forbush decreases by means of muon hodoscope

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Investigations of Forbush decreases in a muon flux have certain peculiarities. First, muons are sensitive to the higher energies (relative to neutrons) of primary cosmic rays (PCRs), opening up new possibilities for studying the heliospheric perturbations responsible for the modulation of high energy PCRs. Second, muons save the direction of the primary particle motion, allowing to obtain the spatial-angular characteristics of cosmic ray modulation using just one facility. Such investigations are now possible, due to the muon hodoscopes that detect the flux of cosmic ray muons on the Earth's surface simultaneously from different directions (hodoscope mode). It's allows study the energy, angular and spatial-temporal characteristics of variations of the cosmic ray muon flux during Forbush decrease (FD). For that, an especial research methodology was developed. The results of the analysis of the FDs registered by means of URAGAN in the period from 2006 to 2013 are presented. With the help of a single methodology, decrease the amplitudes of the intensity of the cosmic ray muon flux in dependence on the energy of the primary particles in the region above 10 GeV are obtained, and their changes at different phases of development of the FD are investigated. Based on the analysis of spatial and angular variations of the muon flux unique "muon snapshots", values of vector of the local anisotropy and correlations between its projections on the South and East are obtained.

Collaboration

- not specified -

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48

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