

Study of the anisotropy of cosmic rays during the periods of the minima of the 24th solar cycle using the muonography method according to the data of the URAGAN muon hodoscope

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Muon hodoscope URAGAN (MEPhI, Moscow) with an area of 45 sq. m is capable of real time detection of the tracks of all muons arriving from the upper celestial hemisphere with a high spatial and angular accuracy (1 cm and 1 degree, respectively). The spatial-angular distribution of the muons flux, measured by means of the URAGAN hodoscope for a certain period of time (1 min.) and expressed in values of the R.M.S. deviation from an averaged reference matrix is a one-minute angular matrix corrected for the barometric and temperature effects and contains information on the current variation the flux of cosmic muons associated with modulation processes in the heliosphere, magnetosphere and atmosphere of the Earth. Such a matrix, by analogy with X-ray radiography, is a muonograph of the Earth's atmosphere and near-terrestrial space. The sequence of muonographs converted to the GSE coordinate system allows one to study in real time the dynamics of cosmic ray anisotropy and to identify in advance geoeffective processes in the heliosphere associated with solar activity. The paper discusses the results of the analysis of the anisotropy of the CR muon flux at the minima of the 24th SC in 2009-2010 and 2018-2019.

Keywords

solar-terrestrial physics, hodoscope, muon detector, muon flux, coronal mass ejections, the Sun

Collaboration

other Collaboration

Subcategory

Experimental Results

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