Contribution ID: **64** Type: **Original Talk**

A network of muon hodoscopes for monitoring of the processes of ”space” and atmospheric weather

Igor Yashin

At present, in addition to direct observations of the Sun using space born apparatus, ground-based equipment that registers cosmic rays is widely used to monitor solar activity - neutron monitors, muon telescopes (hodoscopes) and other detectors. Neutron monitors detect neutrons from primary cosmic particles of GeV energies (˜ 10 GeV), while the muon component is generated by primary particles with energies from tens to hundreds of GeV. Muons retain the direction of primary particle motion with good accuracy, which allows us to study the anisotropy of cosmic rays caused by solar and magnetosphere activity. The capabilities of muon diagnostics of near- terrestrial space were demonstrated by means of precision muon hodoscopes created at MEPhI, for which methods of muonography were developed, allowing real-time observation of processes in the heliosphere, magnetosphere and atmosphere of the Earth. An important advantage of muon hodoscopes is the ability to monitor the state of the atmosphere over an area of about 10ˆ4 sq. km. However, despite the fact that a wide-aperture muon hodoscope allows one to detect and analyze variations in the muon flux over a wide range of zenith angles, a limitation for ground-based studies of near-Earth space is the rotation of the Earth, as a result of which the disturbed region in the heliosphere leaves the aperture of the ground-based detector after 2–3 hours. The report considers the project of creating a network of ground-based hodoscopes placed in different geographical locations. To solve this problem, it is proposed to create the first segment of the future network of three muon hodoscopes, which will be placed in Kaliningrad (branch of IZMIRAN), in the Moscow region (MEPhI - IZMIRAN) and in Irkutsk (ISTP SB RAS).

Primary author: YASHIN, Igor (National Research Nuclear University MEPhI)

Presenter: YASHIN, Igor (National Research Nuclear University MEPhI)

Session Classification: Cosmo- and geophysical aspects of cosmic rays at the ground level

Track Classification: Cosmo- and geophysical aspects of cosmic rays at the ground level