



A new approach to the Earth's atmosphere monitoring: muon diagnostics

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A new method to probe the atmosphere in order to find perturbed regions, to follow their propagation above large areas and to forecast the local hurricane appearance is considered. The physical essence of the method lies in close connection of thermodynamic processes in the atmosphere and modulations of cosmic ray muon flux at the Earth's surface, since muon generation processes are sensitive to atmospheric conditions.

For practical realization of the technique, muon detectors with the ability of simultaneous registration of cosmic ray muons coming from various directions are required. Besides, such a detector has to have large acceptance and high angular accuracy. Such muon detectors have been constructed in Moscow Engineering Physics Institute (poster presentation at GI1 section), and are being used for muon registration at present.

In this talk, some results of studies of muon flux variations aimed at monitoring of atmosphere above Moscow region are presented. The preliminary analysis shows that the proposed method allows to conduct continuous filming of atmosphere over thousands of sq. km and reveal thunderhead from large distances. Moreover, wavelet analysis of muon flux variations allows to detect wave-like modulations initiated by pow-

erful storms similar to the hurricane that produced large destructions in the north of Moscow region in Summer, 2005, though the epicenter of the thunderstorm was situated 140 km far from the setup. Further perspectives of muon diagnostics for remote monitoring and forecasting are also discussed.