



Muon diagnostics of the Earth's atmosphere

N. S. Barbashina (1), V. V. Borog (1), J.-N. Capdevielle (2), R. P. Kokoulin (1),
A. A. Petrukhin (1), O. Saavedra (3), D. A. Timashkov (1), I. I. Yashin (1)

(1) Moscow Engineering Physics Institute, Russia, (2) College de France, France, (3) Torino University, Italy

A new method to probe the atmosphere in order to find perturbed regions, to follow their propagation above large areas and to forecast the hurricane anomalies of local origin is proposed. The physical essence of the method lies in close connection of thermodynamic processes in atmosphere and modulations of muon flux at the Earth's surface since muon generation processes are sensitive to atmospheric conditions. This approach is based on simultaneous registration of cosmic ray muons coming from various directions. For practical realization of the technique, muon detectors with large acceptance and high angular accuracy are required.

Such muon detector has been constructed in Moscow Engineering Physics Institute (poster presentation at GI1 section), and it is being used for muon registration at present. In this talk, some preliminary results of studies of muon flux variations aimed at monitoring of top atmosphere of the Earth are discussed. The preliminary analysis shows that the proposed method allows to find wave-like modulations initiated by powerful 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 at 140 km from the setup.