

Studying of the muon energy spectrum in the Baikal-GVD neutrino telescope

The muon component of extensive air showers (EAS) is widely used in the High-energy Physics as a tool for studying the processes of nucleus-nucleus interactions and secondary particle decays. Muons with energies above 100 TeV (very-high energy muons, VHE-muons) can provide information about new processes of muon generation. So the task of measuring the energy spectrum of such muons is promising. Nowadays, the only instrument for measuring the energy of VHE-muons in the range of above 10 TeV are the gigaton neutrino telescopes, such as IceCube and Baikal-GVD.

VHE-muons lose their energy stochastically, producing high-energy cascades, which could be used for the muon energy spectrum estimation. High-energy cascades selection technique is based on reconstructing longitudinal energy loss profile of muons with Cherenkov light and on determining the ratio of it's maximum and medium values (the peak-to-median ratio p/m). In this work, the abovementioned technique was tested for the Baikal-GVD detector, and the spectrum of cascades from EAS muon bundles was analyzed.

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