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## Results of measurements of the flux of albedo muons with NEVOD-DECOR experimental complex

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Results of investigations of near-horizontal muons in the range of zenith angles of 85 –94 degrees are presented. In this range, so-called ‘albedo’ muons (atmospheric muons scattered in the soil into the upper hemisphere) are detected.

Measurements have been conducted with the NEVOD-DECOR experimental complex located in MEPhI. The basis of the complex is the Cherenkov water detector NEVOD with volume of 2000 m<sup>3</sup> equipped with a dense spatial lattice of quasi-spherical modules (91 in total). Each module consists of six FEU-200 PMTs with flat photocathodes directed along the axes of the orthogonal coordinate system. The coordinate detector DECOR is deployed around the NEVOD. DECOR includes eight vertically suspended eight-layer assemblies of plastic streamer tube chambers with resistive cathode coating with the total sensitive area of 70 m<sup>2</sup>. Chamber planes are equipped with two-coordinate external strip readout system. Detector DECOR allows to localize tracks of near-horizontal muons with high angular (better than 1 degree) and spatial (about 1 cm) accuracy and allows to determine the muon direction by means of time-of-flight technique. More reliably, muon direction can be obtained from the NEVOD data using the directionality of Cherenkov light. The combination of these two independent methods allows to determine the muon direction with the probability of error less than 10<sup>-8</sup>.

We have analyzed the data collected of the experimental complex in 2002 - 2004 (10548 hours of ‘live’ time) and also data acquired after modernization of the NEVOD measuring system in 2011-2015 (19843 hours of ‘live’ time). About 5.46 million muons with the threshold energy of 7 GeV were detected in the range of zenith angle 85 –94 degrees. Moreover 5717 muons were detected with zenith angles more than 91 degrees, so these particles are albedo muons. Measurement results are compared with simulations based on different models of muon scattering in soil.

### Summary

The results of the measurements of the flux of albedo muons for experimental series with the duration of about 30,000 hours ‘live’ time and their comparison with different models of muon scattering in soil are presented.

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