

Large-scale tracking detector TREK for cosmic ray muon bundle investigations at large zenith angles

Tuesday 31 October 2023 17:35 (15 minutes)

A large-scale tracking detector TREK has been constructed at the National Research Nuclear University MEPhI. This detector has been developed for the purpose of investigating cosmic ray muon bundles at large zenith angles. Covering an area of 250 square meters, the detector consists of two planes of multi-wire drift chambers. The main features of this detector is the vertical deployment of detecting planes.

The TREK detector provides practically a continuous area that is 7 times larger and 10 times better in track resolution compared to its counterpart, the DECOR detector. These advancements significantly contribute to addressing the “muon puzzle”. This puzzle pertains to the origin of the observed excess of cosmic ray muons, which begins at energy range of 10 PeV and has been a subject of investigations in experiments like NEVOD-DECOR, IceCube, the Pierre Auger Observatory, and others.

The report presents the results of launching the planes of the TREK detector, the results of testing of drift chambers on the testbench. The estimates of the efficiency and the accuracy of track reconstruction will be discussed.

Primary author: TROSHIN, Ivan (Yurievich)

Co-authors: Mr KHOMCHUK, Evgeniy (NEVOD); NIKOLAENKO, Roman (MEPhI); VOROBYEV, Vladislav (MEPhI); ПЕТРУХИН, Анатолий (Национальный исследовательский ядерный университет “МИФИ”); ЗАДЕБА, Егор (Национальный исследовательский ядерный университет «МИФИ»); КОКОУЛИН, Ростислав (МИФИ)

Presenter: TROSHIN, Ivan (Yurievich)

Session Classification: High Energy Physics

Track Classification: High Energy Physics