

## **Current status of the TREK detector for studies of cosmic ray muon bundles at large zenith angles**

*Wednesday, 28 June 2023 18:00 (15 minutes)*

At National Research Nuclear University MEPhI, a large-scale coordinate-tracking detector TREK for the study of muon bundles at large zenith angles is under construction. The detector has an area of  $250\text{ m}^2$  and consists of two planes of multi-wire drift chambers.

In joint operation with the Cherenkov water detector of 2000 tons of distilled water, the TREK detector will provide an unprecedented investigation of near-horizontal flux of muon bundles generated in the interactions of ultra-high-energy cosmic rays. This research will contribute to resolving the «muon puzzle» concerning the origin of the excess of cosmic ray muons, which has been observed in such experiments as NEVOD-DECOR, IceCube and the Pierre Auger Observatory. The report presents the results of assembling and launching the inner plane of the TREK detector, the results of the gas mixture purging, the results of testing and passportization of drift chambers on the testbench. The estimates of the efficiency and the accuracy of track reconstruction will be discussed.

**Primary author:** TROSHIN, Ivan (MEPhI)

**Co-authors:** PETRUKHIN, Anatoly (MEPhI); KOKOULIN, Rostislav (MEPhI); GAZIZOVA, Diana (NRNU MEPhI); KHOMCHUK, Evgenyi (National Research Nuclear University MEPhI); KOMPANIETS, Konstantin (MEPhI); MIROSH-NICHENKO, Egor; NIKOLAENKO, Roman; ZADEBA, Egor (MEPhI); VOROBEV, Vladislav (National Research Nuclear University MEPhI); Dr SHULZHENKO, Ivan (National Research Nuclear University MEPhI)

**Presenter:** TROSHIN, Ivan (MEPhI)

**Session Classification:** Cosmic rays of very high energies (> 1 PeV)

**Track Classification:** Cosmic rays of very high energies (> 1 PeV)