

The data acquisition system of the coordinate-tracking detector TREK

Tuesday, 27 June 2023 16:45 (15 minutes)

The large-scale coordinate-tracking detector TREK is being constructed at the Experimental Complex NEVOD (MEPhI, Moscow). It is designed to detect high-density muon bundles of inclined extensive air showers. It will significantly expand the capabilities of the experimental complex and ensure the progress in solving the «muon puzzle».

The main elements of the coordinate-tracking detector TREK are: the drift chambers (DCs), the time-to-digital converters (TDCs), and a control computer, running DAQ software. The detector consists of two coordinate planes including 132 DCs each. The total area of the coordinate plane is 250 sq. meters. The chambers of each plane are divided into 18 clusters. Each cluster is served by its own TDC ensuring precise measurement of DC hit times, as well as periodic noise measurements. To provide synchronous operation and triggering of TDCs, the registering system of the TREK detector is connected to the System of Global Time Synchronization of the Complex, as well as to the triggering system of the NEVOD-DECOR-CTS experiment. The control and monitoring of the DAQ system, as well as TDC data read-out and storing are performed by the specially developed software.

In the talk, we describe the structure and operation principals of the TREK detector DAQ system, as well as the architecture and features of its software.

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Session Classification: Poster Session

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