

Fast Charged Particle Detector with High Dynamic Range at Horizon-10T Cosmic Rays Detector System

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Horizon-10T (H10T) detector system is constructed to study the Extensive Air Showers (EAS) with energy of the primary particle above 10^{16} eV. Detector system consists of 10 detection points. The aim of the H10T is the study of the spatial and temporal structure of EAS events. For that purpose, each detection point should have high time resolution, so the fast time response of the components. H10T detection points were equipped with the fastest PMT-based particle detectors with 2 ns rise time of the pulse. Single detector consists of the optical glass as the detection medium and fast Hamamatsu R7723 photomultiplier tube (PMT). Detectors allow single minimum ionizing particle (MIP) calibration and have dynamic range up to 3000 MIP for cosmic rays detection. Simulation, construction and calibration of this detector system will be presented.

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