

The unusual structure detection in Extensive air shower events at Horizon-8T cosmic rays detector system

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Horizon-8T is a detector system aimed to study Extensive Air Showers (EAS) temporal structure in the energy range of the primary above $\sim 10^{16}$ eV. It is constructed at approximately 3340 meters above the sea level at the Tien Shan high-altitude Science Station, part of Lebedev Physical Institute of the Russian Academy of Sciences. Detector system consists of eight charged particle detection points separated by the distance up to one kilometer.

During Physics Run 1 from October 2016 to April 2017, about 8000 total events were detected, a sizable number of which exhibit the unusual spatial and temporal structure of pulses with several maxima (or modes). The separation of the maxima can be from few tens of ns to several hundred ns. The Run 1 dataset suggests that separation between maxima increases with distance from EAS core, which cannot be obtained from simulations, and seem to occur only in events with energy above $\sim 10^{17}$ eV. The overview of Horizon-8T detector system and the details of the unusual events data will be presented.

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