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Search and study for extensive air shower events in the TUS detector data

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The TUS experiment is designed to investigate the ultra high energy cosmic ray (UHECR) at energy ˜ 100 EeV from the space orbit by the UV radiation measurement of extensive air showers (EAS). It was launched on board the "Lomonosov" satellite from the Vostochny Cosmodrome on April 28, 2016 for 5 years of data taking. It is the first orbital telescope aimed for such measurements. The main mode of operation has 0.8 us temporal resolution with a 200 us duration of measured waveforms. Spatial resolution in the atmosphere is 5 km with a total field of view of about 80x80 kmˆ2. There are two main parts of the detector: a modular Fresnel mirror and a photo receiver matrix with the corresponding DAQ. The TUS apparatus structure, methods of UHECR on-line selection and a multi-level algorithm for the search of EAS-like events was developed and applied to the TUS data set analysis. A few UHECR EAS candidates were found. The preliminary results of the TUS data analysis, including the PMT relative calibration, search and study of candidates for the UHECR event are presented.

Primary author(s) : LAVROVA, Maria (Joint Institute for Nuclear Research); FOR THE LOMONOSOV-UHECR/TLE COLLABORATION

Presenter(s) : LAVROVA, Maria (Joint Institute for Nuclear Research)

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