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Recent results from the TUS/LOMONOSOV Space Mission

TUS (Tracking Ultraviolet Set-up) is the first orbital detector of extreme energy cosmic rays (EECR). It was launched into orbit on April 28, 2016, as a part of the scientific payload of the Lomonosov satellite mission. The detector is aimed to test the technique of measuring UV fluorescent and Cherenkov radiation of extensive air showers (EAS) generated by primary cosmic rays with energies above 50 EeV. The TUS detector is a UV telescope looking in the nadir direction from the altitude of ~500 km. It consists of a 2 m² mirror and a 256-pixel photo detector and has a $\pm 4.5^\circ$ field of view with 5×5 km² spatial resolution in the atmosphere. During more than a year of operation, a number of EAS-like events were measured by the detector. Some of them are caused by atmospheric phenomena of anthropogenic sources, some are considered as EAS candidates. We report results of a search for EAS-like events in the TUS data and their analysis with an emphasis on a strong EECR candidate registered on October 3, 2016. Conditions of the measurements were studied to exclude thunderstorm atmospheric events. An arrival direction and energy of a primary particle were estimated basing on results of extensive simulations and new reconstruction algorithms.

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