

Study of the calibration method using the stars measured by the EUSO-TA telescope

Friday 16 July 2021 19:18 (12 minutes)

EUSO-TA is a ground-based experiment, placed at Black Rock Mesa of the Telescope Array site as a part of the JEM-EUSO (Joint Experiment Missions for the Extreme Universe Space Observatory) program. The fluorescence detector with a field of view of about $11^\circ \times 11^\circ$ consisting of 2304 pixels (36 Multi-Anode Photo-multipliers, 64 channels each) works with 2.5-microsecond time resolution. An experimental setup with two Fresnel lenses allows for measurements of Ultra High Energy Cosmic Rays in parallel with the TA experiment as well as the other sources like flashes of lightning, artificial signals from UV calibration lasers, meteors or stars. The stars crossing the field of view as the point-like sources, increase counts on pixels. In this work, we discuss the method for calibration of EUSO fluorescence detectors based on signals from stars registered by the EUSO-TA experiment during several campaigns. As the star positions during measurements are known, the analysis of signals gives an opportunity to determine the pointing of the detector. This can be applied to space-borne or balloon-borne EUSO missions. We describe in details the method of the analysis which provides information about detector parameters like the shape of the point spread function and is the way to perform absolute calibration of EUSO cameras.

other Collaboration

JEM-EUSO

Keywords

Cosmic Rays, EUSO-TA, Fluorescence Detector, Absolute calibration, Star UV measurements

Collaboration

Subcategory

Experimental Methods & Instrumentation

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Session Classification: Discussion

Track Classification: Scientific Field: CRI | Cosmic Ray Indirect