Contribution ID: **290** Type: **Poster**

Detectors of the Telescope Array Experiment (at WG6)

Tuesday, 2 August 2022 17:55 (10 minutes)

The Telescope Array (TA) experiment, located near Delta, Utah, USA, is the largest ultra-high energy cosmic ray (UHECR) observatory in the northern hemisphere. When a UHECR primary particle arrives at the Earth, it collides with the atmosphere and produces a cascade of secondary particles known as an extensive air shower (EAS). The Telescope Array is designed to observe the EAS using a hybrid of techniques: fluorescence detectors (FDs) and surface detectors (SDs). The FDs measure the nitrogen fluorescence light emitted when the secondary particles excite the gas of the atmosphere as they pass through it. They utilize telescopes consisting of large area mirrors and photo-multiplier tube cameras. Meanwhile, the SDs use two-layer plastic scintillators to sample the density of charged particles in the showers when it reaches the Earth's surface. Using data from both the FDs and SDs, we explore the nature and origin of UHECRs by investigating the energy spectrum, mass composition, and arrival direction distribution. In this presentation, we describe the design and technical features as well as some of the measurements of the Telescope Array detectors.

Attendance type

In-person presentation

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Session Classification: WG6: Detectors

Track Classification: WG6: Detectors