Contribution ID: **135** Type: **Poster**

EUSO-TA prototype telescope

Friday, 29 May 2015 10:22 (0 minutes)

EUSO-TA is one of the prototypes developed for the JEM-EUSO project, a space-based large field-of-view telescope to observe the fluorescence light emitted by cosmic ray air showers in the atmosphere. EUSO-TA is a ground-based prototype located at the Telescope Array (TA) site in Utah, USA, where an Electron Light Source and a Central Laser Facility are installed. The purpose of the EUSO-TA project is to calibrate the prototype with the TA fluorescence detector in presence of well-known light sources and cosmic ray air showers.
EUSO-TA consists of two 1 m squared Fresnel lenses, with a field-of-view of 11°. The lense system focuses the light on a Photo Detector Module (PDM), identical to those (137) that will form the JEM-EUSO focal surface. The PDM currently consists of 36 Hamamatsu multi-anode photomultipliers (MAPMTs) with 64 channels each, for a total of 2304 channels. Front-End readout is performed by 36 ASICS, with trigger and readout tasks performed by two FPGA boards that send the data to a CPU and a storage system.
The detector was installed in February 2015 and tests using the mentioned light sources have been performed successfully, as well as observations of stars of different magnitude and color index.
Since Silicon Photo-Multipliers (SiPMs) are very promising for fluorescence telescopes of next generation, they are under consideration for the realization of a PDM. The response of this sensor type is investigated by simulations and in the laboratory.

Collaboration

JEM-EUSO Collaboration

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Session Classification: Detector Techniques for Cosmology, Astroparticle and General Physics - Poster Session

Track Classification: S8 - Detector Techniques for Cosmology, Astroparticle and General Physics