



The extension of the Telescope Array experiment

Monday 8 August 2016 18:30 (2 hours)

TAx4, Telescope Array Low Energy extension (TALE) and the Non-Imaging Cherenkov Array (NICHE) are extension plans of the Telescope Array (TA) experiment.

The TA experiment was originally designed to study ultra-high energy cosmic rays with energies above about 1 EeV ($1 \text{ EeV} = 10^{18} \text{ eV}$) using surface detectors (SDs) and fluorescence detectors (FDs). These extension plans will enable us to observe cosmic rays with energies over 5 orders-of-magnitude (1 PeV - 100 EeV) in the same observation site in Utah. The construction of the detectors of TAx4, TALE and the prototype of NICHE (j-NICHE) has been already started.

New SDs and FDs will be constructed for TAx4 to cover 4 times larger area than TA to observe cosmic rays with energies above 10 EeV with high statistics. This project is expected to clarify the source of the hotspot (Abbasi et al. 2014) in the arrival directions of cosmic rays with energies above 57 EeV.

The TALE experiment has already measured cosmic rays to well below 0.1 EeV using newly developed FDs. New SDs are being constructed to be added around TALE FDs for better efficiency and resolution. The NICHE detectors are designed to observe cosmic rays with energies above 1 PeV using non-imaging Cherenkov technique. The measurement by TALE and NICHE over wide range of energies will provide accurate understandings of the transition from galactic cosmic rays to extragalactic cosmic rays using cross-calibration between different techniques.

In this talk, the current status and the future prospects of the extension plans are shown.

Author: KIDO, Eiji

Presenter: KIDO, Eiji

Session Classification: Poster Session

Track Classification: Astro-particle Physics and Cosmology