

[10-01] Construction of Telescope Array Ultra High Energy Cosmic Ray Experiment

양종만¹, 김보금¹, 김지은¹, 나고운¹, 남신우¹, 박일홍¹, 박재형¹, 오세지¹,
이소정¹, 이재금¹, 임선인¹, 정태신¹, 강혜성², 권영준³, 조일성³,
류동수⁴, 김항배⁵, 신복균⁵, 유지운⁵, 천병구⁵

¹이화여자대학교 물리학과, ²부산대학교 지구과학교육과, ³연세대학교 물리학과
⁴충남대학교 천문우주과학과, ⁵한양대학교 물리학과

A ground-based ultra high energy cosmic ray experiment, named Telescope Array (TA), has been constructed in Millard county, Utah, USA by an international collaboration of Japan, Korea, and USA. It is designed to observe cosmic rays of energy above $10^{18.5}$ eV upto $10^{20.5}$ eV. The TA includes 512 plastic scintillator detectors of 3 m² surface area, each spaced by 1.2 km, which cover 800 km², and three atmospheric fluorescence telescopes at 1,400 m above sea level. The entire construction will be completed by the end of this year. We report the status of the construction, testing, and data management plan.

[10-02] Silicon Charge Detector for the CREAM Experiment

박나희¹, H.S. Ahn², O. Ganel², 전진아¹, M.H. Lee², 남신우¹,
박일홍¹, E.S. Seo^{2,3}, P. Walpole², 양종만¹, Y.S. Yoon³

¹이화여자대학교 물리학과

²Institute for Physical Science and Technology, University of Maryland

³Department of Physics, University of Maryland

By measuring the charge and energy of incident particles, CREAM (Cosmic Ray Energetics And Mass) experiment is aimed to investigate the acceleration and propagation mechanism of high energy cosmic rays up to 10¹⁵ eV where the characteristic kink, referred as "knee", appeared in the all particle spectrum. Silicon charge detector is designed to provide the charge information of charged particles from proton to iron for the CREAM experiment. As a part of balloon payload, it is designed to function in a relatively wide temperature variation with an atmospheric pressure near 5 Torr. To avoid the charge miss-identification by the backscattered secondary particles produced in the calorimeter located below the SCD, it is comprised of finely segmented silicon pixel sensors covering ~ 0.62 cm² without dead area. The design, construction, tests of the silicon charge detector will be presented as well as the preliminary results from the previous CREAM flights and preparation for the next flight.