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**Fluoresence Detection of Cosmic Ray Air Showers Between $10^{16.5}$ eV and $10^{18.5}$ eV with the Telescope Array Low Energy Extension (TALE)**
ZACHARY ZUNDEL, JEREMY SMITH, STAN THOMAS, TAREQ ABUZAYYAD, DMITRI IVANOV, JOHN MATTHEWS, CHARLES JUI, University of Utah, TELESCOPE ARRAY COLLABORATION — The Telescope Array Experiment has been observing cosmic ray air showers at energies above $10^{18}$ eV since 2008. TA operates three Fluorescence Detector (FD) sites, with telescopes that observe 3-31 deg in elevation. The FD sites are located at the periphery of a surface array of 507 scintillation counters covering 700 $km^2$, with 1.2km spacing. The TA Collaboration has completed building a low-energy extension at its Middle drum FD site. Ten new telescopes currently observe between 33 and 59 degrees in elevation. A graded ground array of between 400 and 600m will be placed in front of the TALE FD. With these upgrades, the physics threshold of TA will be lowered to $10^{16.5}$ eV. The TA Low Energy Extension(TALE) will explore the energy regime corresponding to that of the LHC in center-of-mass frame. This is also the range where the transition from galactic to extra- galactic cosmic ray flux is suspected to occur. We will give a brief overview of the physics, and report on the progress of TALE toward measuring the cosmic ray spectrum between $10^{16.5}$ eV and $10^{18.5}$ eV.

Zachary Zundel
Univ of Utah

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