

Abstract Submitted  
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**Geometry Study of Ultra High Energy Cosmic Ray Showers Using Hybrid Analysis from Telescope Array** MONICA ALLEN, University of Utah, TELESCOPE ARRAY COLLABORATION — The Telescope Array experiment studies ultra high energy cosmic rays at energies  $>10^{18}$  eV using a hybrid detector. Fluorescence telescopes measure the longitudinal development of the extensive air shower generated by a primary cosmic ray particle. Meanwhile, scintillator surface detectors measure the lateral distribution of secondary particles that hit the ground, the “footprint” of the shower. Combining the information from both detectors, a more precise measurement of the shower geometry can be obtained, and hence, a more accurate understanding of the energy and composition of the primary particle. The Middle Drum (MD) fluorescence observatory is located at the northwest corner of the Telescope Array and consists of 14 telescopes. It is one of three fluorescence observatories which observe the sky above the 507 scintillator surface detectors of the Telescope Array. I will discuss the MD hybrid data and resolution. I will show that in comparison with using MD information alone, the hybrid method improves the geometrical resolution of the shower by a factor of five in shower-detector plane angle, and by an order of magnitude in the shower core distance.

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