Ultra High Energy Cosmic Ray Composition Observed by Telescope Array in Hybrid Mode WILLIAM HANLON, Univ of Utah, TELESCOPE ARRAY COLLABORATION — The distribution of nuclear species is a fundamental parameter of models that describe the origin and propagation of ultra high energy cosmic rays (UHECRs), commonly referred to as UHECR composition. Composition affects the shape of the UHECR energy spectrum observed on Earth, limits the maximum distance of propagation due to interactions with the CMB, and provides information about the acceleration mechanisms of their sources. Due to the extremely low flux of cosmic rays with energies $> 10^{15}$ eV, direct measurement of composition is not practical. However, the properties of particle cascades caused by UHECRs interacting in the atmosphere are related to their mass, allowing us to indirectly measure composition using statistical inference. In this talk we will present recent results of X_{max} measurements by Telescope Array (TA), a very large cosmic ray observatory located in central Utah with a view of the northern hemisphere. Nearly nine years of hybrid X_{max} data are analyzed and compared to Monte Carlo simulations of UHECRs with energies exceeding $10^{18.2}$ eV. We also calculate and present distributions of X_{max} and test the compatibility of data with Monte Carlo simulations of four different chemical species.

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