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Telescope Array measurement of UHECR composition from stereoscopic fluorescence detection

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The chemical composition of ultra-high-energy cosmic rays (UHECRs) affects the observable distribution of air-shower X_{\max} values, the atmospheric slant depth at which the number of secondary shower particles reaches its maximum. The observed X_{\max} distributions at various primary UHECR energies can be compared with the distributions predicted by detailed detector simulations for any assumed composition and high-energy hadronic interaction model. In this poster, we present measurements of X_{\max} by the Telescope Array (TA) fluorescence detectors with stereoscopic shower reconstruction. We find that for all hadronic models considered, the data collected since TA operation began in 2007 is consistent with a chiefly light UHECR composition.

Collaboration

Telescope Array

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Primary author: Dr STROMAN, Thomas (University of Utah)**Co-author:** Dr TAMEDA, Yuichiro (Institute for Cosmic Ray Research, University of Tokyo)**Presenters:** Dr STROMAN, Thomas (University of Utah); Dr TAMEDA, Yuichiro (Institute for Cosmic Ray Research, University of Tokyo)**Session Classification:** Poster 1 CR**Track Classification:** CR-EX