

Abstract Submitted
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Measuring the Electric Field During Thunderstorms by the Telescope Array detector KALEIGH O'BRIEN, RASHA ABBASI, HANS JOHNSON, JOE MAZICH, Loyola University Chicago, NOUR HUSSEINI¹, Illinois Mathematics Science Academy — Acquiring knowledge of electric field strength and structure inside a thunderstorm is key to understanding lightning and thunderstorms' impact on the development of cosmic showers. Given data from the Telescope Array Surface Detector (TASD), we observed variations in cosmic ray shower intensity. These variations were found to be on average between 0.5-1% with and up to 2-3%. These observations were detected in both deficit and excess. The rate variations were also correlated with lightning and thunderstorms. In order to more closely study these variations, we ran low- and high-energy simulations of electric fields within thunderstorms using CORSIKA. These simulations yielded a reasonable result of electric field magnitude variations between 0.2-0.4V, which in turn has informed our understanding of the electric field within storms and its effect on cosmic ray showers.

¹Nour Hussein is a high school student working on our project.

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