

Abstract Submitted
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The Atmospheric Aerosol Density at the Telescope Array Site¹

DAVIS UNRUH, University of Utah — As cosmic ray showers propagate down through the atmosphere, their interactions with atmospheric particles generate ultraviolet photons which can be detected by air-fluorescence telescopes. The Telescope Array (TA) Project utilized three such air-fluorescence telescopes to detect and visualize cosmic ray showers. However, in order to accurately model a cosmic ray shower using this technique it is important to know the Vertical Aerosol Optical Depth (VAOD), a measure of the amount of photons removed from a beam by aerosol scattering over a given distance. To measure this constant, which fluctuates daily, data was analyzed from the Telescope Array Central Laser Facility (CLF), a system which fires laser pulses vertically into the sky equidistant from TA's air-fluorescence telescopes. In particular, I have examined the dependence of the number of photons arriving at the fluorescence telescopes on the energy of the fired laser and the altitude at which they were scattered from the vertical beam. The presence of nights in which the VAOD is approximately zero allow for measurement of the constant effect of Rayleigh scattering, in turn enabling measurement of the VAOD for any given night. Utilizing this technique, plots of VAOD for three years of data were generated.

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