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ATMOSPHERIC AEROSOL EFFECT ON FD DATA ANALYSIS AT THE PIERRE AUGER OBSERVATORY

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The atmospheric aerosol monitoring system of the Pierre Auger Observatory, initiated in 2004, continues to operate smoothly. Two laser facilities (Central Laser Facility, CLF and eXtreme Laser Facility, XLF) each fire sets of 50 laser shots four times per hour during Fluorescence Detector (FD) shifts.

The FD measures these UV laser tracks. Analysis of these tracks yields hourly measurements of the aerosol attenuation loads, expressed as Vertical Aerosol

Optical Depth (VAOD) profiles. These VAOD profiles, which may be highly variable, are used to correct the observed longitudinal UV light profiles of the Extensive Air Shower tracks detected by the FD. Two analysis techniques are used to obtain the VAOD profiles. The techniques been proven to be fully compatible. Measurement uncertainty of the VAOD profiles contribute to the measurement uncertainty of the reconstructed energy and depth at the maximum development of a shower (X_{max}) of air shower events. To confirm the validity of the VAOD profiles applied to the FD event analysis, the flatness of the ratio of reconstructed SD to FD energy as a function of the aerosol transmission to the depth of shower maximum has been verified to be at the level of 0.6%.

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