

AtmoHEAD: Atmospheric Monitoring for High-Energy Astroparticle Detectors



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LIDAR'S TELESCOPE AUTO-ALIGNMENT SYSTEM FOR CTA

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A multi-wavelength scanning Raman lidar is being developed at CEILAP (CITEDEF-CONICET) to monitor the spectral properties of the aerosol extinction in the future CTA Observatory. The reception system of the lidar uses six Newtonian telescopes, with a mirror diameter of 40 cm and a focal length of 1 m. Fused silica optical fibers fix the field of view of the telescopes to 1 mrad and send the collected light to a polychromator. As the system is being exposed to harsh environmental conditions (wind burst, temperature span, etc...) robustness of the individual telescopes and self-alignment have been considered as the highest priorities in the design. In the current setup cooperative wireless interactions between the controlling PC software and the lidar microcontrollers keep the line of sight of the telescopes parallel to the laser emission. This design assures the quality of the acquired data independently of the skills of the remote lidar operator. The self-alignment system as well as the lidar hardware and software modules are extensively presented in this work.

Key words: aerosols, lidar, Raman, CTA observatory.

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