

DEVELOPMENT OF MULTIWAVELENGTH SCANNING RAMAN LIDAR FOR CALIBRATION OF SHOWER DETECTION SYSTEMS

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Abstract

At Lidar Division, CEILAP (CITEDEF-CONICET), a multi-wavelength scanning Raman lidar is being constructed to measure atmospheric aerosol extinction profiles to provide better transmission calculations of the Cherenkov and the nitrogen UV light emission in the frame of the Cherenkov Telescope Array (CTA) and Pierre Auger Projects respectively. This lidar emits laser pulses of 7-9 ns at 355, 532 and 1064 nm with a repetition rate of 50 Hz and collects the atmospheric elastic backscattered light as well as the UV and visible nitrogen raman scatters using six 40 cm f/2.5 newtonian telescopes. An additional channel is added to retrieve the atmospheric water vapor number density profile. Automatic tracking procedure acting over each mirror plate permits the individual alignment of each telescope to follow the line of sight of the observation during the acquisition period. The system was designed to operate in hard environmental conditions as it is completely exposed to the outside weather conditions when its shelter is fully opened to provide 360° observation. These system characteristics are ideal to obtain an accurate extinction profile in a relatively short time, fitting the requirements of Auger and CTA Observatories in the reconstruction of the primary cosmic or gamma ray shower. First results are presented.