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ARCADE –Atmospheric Research for Climate and Astroparticle Detection

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The characterization of the optical properties of the atmosphere in the near UV, in particular the tropospheric aerosol stratification, clouds optical depth and distribution are common to the field of the physics of the atmosphere, due to aerosol effect on climate, and also to the physics of cosmic rays, for a correct reconstruction of energy and longitudinal development of showers.

The goal of the ARCADE-Project is the comparison of the aerosol attenuation measurements obtained with the typical techniques used in cosmic rays experiments (side-scattering measurement, elastic-LIDAR and Raman-LIDAR) in order to assess the systematics affecting each method providing simultaneous observations of the same air mass with different techniques. For this purpose we projected a LIDAR that is now under construction: it will use a 355 nm Nd:YAG Laser and will collect the elastic and the N₂ Raman back-scattered light. For the side-scattering measurement we will use the Atmospheric Monitoring Telescope, a facility owned by the Colorado School of Mines and placed in Lamar (Colorado), the site where our experiment will take place starting from 2013.

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