



Radiative forcing, physical and chemical properties of atmospheric aerosols at Central Andes of Peru

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Measurements of the interaction of atmospheric aerosols and solar radiation at surface stations are critical for verifying climate models and satellite measurements. The World Climate Research Programme (WCRP) Baseline Surface Radiation Network (BSRN) has been monitoring solar radiation for more than 10 years.

AERONET network from NASA also has promoted the installation of high quality sunphotometers worldwide. Aerosols samplers are used 24 hours for collecting aerosols that later undergoes to elemental chemical composition analysis.

Although these programs, western South America is a region with scarce measurements based on international guidelines. In that sense this proposal presents the implementation of a monitoring component at this region related to evaluate interactions of solar radiation and atmospheric aerosols. It is located at the Observatory of Huancayo at Peru (lat. 12.05, long. 75.32 and altitude 3.313 masl). The site is located at the Andes mountain region where is expected to receive highest intensity of solar radiation. It is also a region with important influence of aerosols coming from Amazon biomass burning during dry season and some episodes of dust from coastal desert.

So this work involves the use of high accuracy instruments for continuous measurements of solar radiation based on BSRN guidelines that determines the energy budget at the surface. Atmospheric aerosols physical, optical and radiative properties were determined with AERONET sunphotometer, an aethelometer for measuring black carbon and multielemental chemical analysis of collected coarse (PM10) and fine (PM2.5) aerosols. Aerosol radiative forcing (ARF) is estimated using the SBDART model.

In that sense during recent years the Observatory of Huancayo has improved with scientific instrumentation for atmospheric sciences. It includes a meteorological station, precipitation radar and an energy flux tower, all is part of the Laboratory of Atmospheric Microphysics and Radiation (LAMAR) of the Geophysical Institute of Peru.