



Differences between cloud screening methodologies for broadband radiation, narrowband radiation and all-sky camera observations

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Cloud screening is an essential component of the Aerosol Optical Depth (AOD) retrieval from photometry measurements: the cloud contaminated observations have to be identified and flagged out from the AOD end products. Methods vary on the instruments considered but all apply strict criteria when it comes to determine whether the sun was obstructed by a cloud or not and therefore whether the retrieval is valid. Cloud screening can be performed also using other observations, such as broadband radiation measurements or all-sky camera images. In this work a comparison between the different screening methods will be presented, using data from the Meteorological Observatory Lindenberg from Lindenberg (Tauche, Germany; 52.2°N - 14.1°E, 120 m asl) where observations from pyranometers, pyrgeometers, photometers and all-sky camera are available. For broadband radiation measurements, cloud screening will be performed with two different algorithms: RADFLUX[1] and BrightSun[2]. The first is a clear-sky model, based on global and diffuse shortwave components, able to also yield cloud fraction. The second is a hybrid method that can work either as a clear-sky or clear-sun method, depending on the input model chosen and input measurements available: all clear-sun models will be run along with a few selected clear-sky ones. Cloud screened data are available for both CIMEL (AERONET) and PFR (GAW-PFR) instruments following the respective methodologies of the networks they belong to, in particular, both AERONET [3] and CAELIS [4] algorithms are run for CIMEL data. Cloud screening and cloud cover from all-sky camera are obtained instead by different algorithms[5], one of them being able to also distinguish between thin and opaque clouds. The clear/obstructed sun information obtained from these different methodologies will also be associated with the cloud fraction obtained by broadband radiation measurements and the sky camera cloud masks.

Bibliography

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