



Satellite study over Europe to estimate the single scattering albedo and the aerosol optical depth

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Aerosol particles have a significant effect in the climate over regional and global scales by perturbing the radiation balance of the Earth (IPCC 2007). One of the critical players in the radiative forcing computations is the Single Scattering Albedo (SSA). One of the reasons is the uncertainty in estimating and improving the SSA value. In radiative transfer studies, single scattering albedo is the ratio of scattering optical depth to the total optical depth of the atmosphere. The SSA and the Aerosol Optical Depth (AOD) are two of the main parameters to estimate the aerosol radiative forcing. In this study we are showing the results of the SSA and the AOD at 659 nm obtained with the Advanced Along Track Scanning Radiometer (AATSR) retrievals to study the effect of the forest fires over Europe. These results are validated using AERONET AOD at level 2.0 and the SSA obtained from the inversion products. The SSA is a new AATSR product; it is obtained with a new method, based on Lookup Tables (LUT), for selected aerosol size distribution, with given refractive index. The LUTs are used together with the contribution in the AOD retrievals of absorbing and not absorbing aerosol particles. The SSA can be applied in different studies like the computation of scattering phase function, the characterization of aerosol particles, the radiative transfer model and the earth radiation computation study. Preliminary results show a good agreement between the AOD at 659 nm from AERONET and AATSR with a correlation up to 0.8. The SSA has a high correlation when particles are not absorbing.

1. IPCC, 2007: Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, 989pp.