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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aerosol direct radiative effect in the Po Valley region derived from AERONET measurements" *by* M. Clerici and F. Mélin

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The paper presented by Clerici and Mélin apprehends the Direct Aerosol Radiative Impact for 2 sites in the northern part of Italy. This area is well known as one important source of pollution in Western Europe. For that purpose, this study is interesting and contributes to improve the knowledge of the aerosol and climate community. Authors led the study with about 10 years of AERONET sunphotometric data for aerosol optical characterizations and MODIS data for surface albedos. The study is conducted smartly with an exhaustive analysis of parameters involved in the computation of the aerosol radiative impact. The two chosen sites are pretty different. One, at the end of the Po

Valley and several kilometers off-shore in the vicinity of Venetia, is surrounded (North and West) by industrial area. The second is the small village, Ispra, pretty far from source of pollution. Nevertheless, the atmospheric dynamic within this area leads to a similar aerosol optical thickness for both sites. The aerosol direct effect is lightly different (5 to 10 W/m2) between both sites, with a higher TOA and lower ATM effects for Ispra.

I just have few comments: * About your surface albedo climatology, I’m surprise because it seems snow cover is not considered for the Ispra site. Knowing the huge effect on radiative impact of a drastic change of surface albedo (from 0.05 to 0.70 or more at 550nm), it should be interesting to consider the case! * The aerosol characterizations you found are compared to those found with other AERONET sites (especially Greenbelt and Creteil). The fact these sites are optically equivalent doesn’t mean your characterization is correct. Ranges you found are good, so why did you compare to 2 totally different sites (Greenbelt and Creteil are suburb cities, close to highways and in the vicinity of non industrial city, which means the pollution just comes from traffic)?

Anyway, it’s a nice paper!! It is scientifically interesting and is a good contribution within the scope of aerosol. It is pretty well written and the English is good. So, for me, the paper can be published as it.

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Interactive Comment