



Atmospheric particulate matter (PM10) estimation from optical ground measurements

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Air quality monitoring by optical ground measurements (sun-sky photometer, AOT) is a potential complementary tool to in-situ measurements. Retrieving particulate matter (PM) concentration from the aerosol optical thickness (AOT) is not straightforward. The nonlinear relationships between the two quantities depend on atmospheric structures and meteorological variables. The proposed idea is to simplify the relationship by determining meteorological classes in which the relationship does not depend on meteorological variables.

We first classified the meteorological situations in terms of weather types by using a neuronal classifier (Self organizing Map).

For each weather type, a relationship between AOT and PM10 is established, and a satisfactory prediction of the mass concentration from AOT is given.

We applied this approach to the Lille region (France) for a five-summer period (2003-2007). The good performances of the method led us to envisage the possibility of retrieving the PM10 from satellite observations.