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The optic properties (absorption and diffusion) of the aerosol produced in the city Cairo

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The aim of this work is to quantify the alteration of Scattering and absorbing properties resulting from a mixing type of aerosol: mineral dust, anthropogenic pollutions, and the biomasse smoke. The samples were collected during 2 different intensive observation periods, the fall 2004 (POI - 1) and the spring 2005 (POI-2), of the Cairo Aerosol Characterization Experiment (CACHE).

Each intensive observation period includes several special events, which are dominated by different type aerosols. PM10, black carbon and the organic components mass concentrations are measured by a TEOM Microbalance, and a spectral Aethalometer. The major elements' quantities of the desert dust are measured by an X-ray fluorescence analysis from the sampling filters. A 3 wavelengths Nephelometer and 7 wavelengths Aethalometer are used to determine the aerosol mass scattering and the mass absorption.

By a number of calculations and analyses with the experimental data, we could already draw some conclusions. Comparing with the composition of the desert dust during the two periods, we can say that the dusts are from the different original resources; by the analysis of relative humidity, we know that POI-1 is a period more humid than POI-2, and the relative humidity has non neglected influence on masse absorption; according to the results of "spectral dependence", we can conclude that, black carbon is the main source of light absorption, it absorbs the whole spectral region which we worked on, from 370nm to 950nm. The dust (in fact, the iron oxides) only absorbs the light in short wavelength, and no effect on long wavelength regionĚ

In the coming two months, I am going to work on the optical properties of aerosol Scattering, and finally to give a conclusion of the impact of different type of aerosol

on the climate, the single scattering Albedo, and the “bilan d’énergie” of atmosphere.