Atmos. Chem. Phys. Discuss., 15, C1919–C1920, 2015
www.atmos-chem-phys-discuss.net/15/C1919/2015/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aerosol vertical distribution, optical properties and transport over Corsica (western Mediterranean)" *by* J.-F. Léon et al.

Anonymous Referee #2

Received and published: 27 April 2015

The paper presents continuous measurements from a single wavelength elastic lidar in Corsica in order to characterize the aerosol loading and its vertical distribution. They use the synergy of sunphotometer and satellite data in their analysis. There are many similar papers in the literature for the Mediterranean. However the large spatial variability of the aerosols in the area and the complex situation concerning aerosol sources can justify additional information over a less studied area like Corsica. Therefore in principle the paper could be relevant for ACP.

I have however major concerns concerning the analysis of the lidar data, which leads to conclusions that can hardly be justified. The authors show in Figure 5 monthly mean

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

extinction profiles at 355nm. It is obvious in all these average profiles that there are two serious problems.

The first one has to do with the systematic questionable calibration of the lidar signals in an aerosol free-region. The authors claim that they systematically observed significant aerosol loading at 6 and 7 km (see Figure 5), without showing if and where their signals indicate an aerosol free region. It is highly uncertain that on a monthly basis such layers persist and if this should be true, this has to be verified after a thorough quality control of the lidar signals.

The second problem has to do with the cloud screening of the signals. Again in the monthly average profiles it is obvious that such spikes eventually correspond to clouds layers not filtered properly, rather than systematic dust layers, which usually are much thicker.

The fact that lidar measurements are in good agreement with the sunphotometer should be expected since the lidar measurements are constrained by the AOD from the sunphotometer.

Finally with a single wavelength elastic lidar the separation of aerosol types in the vertical can be highly speculative.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 9507, 2015.