Atmos. Chem. Phys. Discuss., 12, C9170–C9172, 2012
www.atmos-chem-phys-discuss.net/12/C9170/2012/


Atmospheric Chemistry and Physics Discussions

# *Interactive comment on* "African dust outbreaks over the Mediterranean Basin during 2001–2011: $PM_{10}$ concentrations, phenomenology and trends, and its relation with synoptic and mesoscale meteorology" *by* J. Pey et al.

**S. Basart**

sara.basart@bsc.es

Received and published: 9 November 2012

The authors present an extended analysis of African dust outbreaks over the Mediterranean Basin based on an 11-year period using an estimation of natural dust contribution using PM10 data from regional and suburban background sites. At first, I want to congratulate the authors for this work. This will be a very useful dust observational dataset for the scientist community. In fact this could be considered as a first step on the exploitation of rather complete databases. As the authors state in their manuscript, the lack of routinely chemical analysis can be compensated for the application of new



methodologies based on a statistical methods.

The results are consistent with other studies based on aerosol optical properties obtained from satellite, sunphotometer and lidar observations in the region. Therefore, it would be desirable if the authors link their results to previous studies that are found in the literature (e.g. Barnaba and Gobbi, 2004; Antoine and Nobileau, 2006; Papayannis et al., 2008; Basart et al., 2009) to better justify and discuss their results in relation to the typical transport African dust paths to Southern Europe.

Otherwise, the authors highlight the high contribution of African dust in the eastern Mediterranean sites in comparison with western Mediterranean sites. In their discussion, the authors do not consider the contribution of Asian dust sources from Middle East and Negev deserts (in Israel) that also contributes to dust budget in this area as shown in other studies in the region (e.g. Kubilay et al, 2003; Derimian et al, 2006; Koçak et al., 2012). In my opinion, this is the explanation of the high values observed in AYM and FKL sites with maximum impact in AYM due to its proximity to Asian dust sources. If the authors would include the 3-day back-trajectories in the analysis of the dust outbreaks in the eastern Mediterranean (instead the 5-day back-trajectories as indicated in the methodology), they will assure the origin of the air masses in these sites.

References

Antoine, D., and Nobileau, D.: Recent increase of Saharan dust transport over the Mediterranean Sea, as revealed from ocean color satellite (SeaWiFS) observations J. Geophys. Res., 111, 2006.

Barnaba, F., and Gobbi, G. P.: Aerosol seasonal variability over the Mediterranean region and relative impact of maritime, continental and Saharan dust particles over the basin from MODIS data in the year 2001, Atmos. Chem. Phys., 4, 2367–2391, SRef-ID: 1680-7324/acp/2004-4-2367, 2004.

Basart, S., Pérez, C., Cuevas, E., Baldasano, J. M., and Gobbi, G. P.: Aerosol characterization in Northern Africa, Northeastern Atlantic, Mediterranean Basin and Middle East from direct-sun AERONET observations, Atmos. Chem. Phys., 9, 8265–8282, 2009.

Derimian, Y., Karnieli, A., Kaufman, Y. J., Andreae, M. O., Andreae, T. W., Dubovik, O., Maenhaut, W., Koren, I., and Holben, B. N.: Dust and pollution aerosols over the Negev desert, Israel:Properties, transport, and radiative effect, J. Geophys. Res., 111, doi:10.1029/2005JD006549, 2006.

Koçak, M., Theodosi, C., Zarmpas, P., Séguret, M.J.M., Herut, B., Kallos, G., Mihalopoulos, N., Kubilay, N., Nimmoc, M.: Influence of mineral dust transport on the chemical composition and physical properties of the Eastern Mediterranean aerosol, Atmos. Environ., 57, 266-277, 2012.

Kubilay, N., Cokacar, T., and Oguz, T.: Optical properties of mineral dust outbreaks over the northeastern Mediterranean, Geophys. Res., 108, 4666, doi:10.1029/2003JD003798, 2003.

Papayannis, A., Amiridis, V., Mona, L., Tsaknakis, G., Balis, D., Bösenberg, J., Chaikovski, A., De Tomasi, F., Grigorov, I., and Mattis, I.: Systematic lidar observations of Saharan dust over Europe in the frame of EARLINET (2000–2002), J. Geophys. Res., 113, 2008.

---

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 28195, 2012.