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Interactive comment on "Variability of aerosol optical properties in the Western Mediterranean Basin" *by* M. Pandolfi et al.

J. Ogren

John.A.Ogren@noaa.gov

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I regret not having time to read this paper in great detail, but would like to offer a few comments based on a quick reading. In general, the paper is well written, the experimental approach is sound, and the data interpretation is reasonable.

The MAAP measurements are not specific to carbon, nor do they tell you that the signal is due to a black substance. It is more appropriate to report the MAAP measurements as an absorption coefficient. The approach that the authors used to determine Equivalent Black Carbon (EBC) using an empirically-determined mass absorption efficiency from the MAAP and EC measurements is sound (although a discussion of the uncertainty of the EC measurement would be a useful addition to the paper). I recommend replacing the term "BC" with "EBC" throughout the paper, and abandoning the delusion

that the MAAP measures "black carbon".

Please give the model number and lower size cut (D50) of the CPC used in the study.

I recommend using the lower-case "å" rather than the upper-case "Å" for the Ångström exponent, because "Å" is already used widely to represent a length of 10ˆ-10 meter.

The comparison of the mass absorption efficiency with literature values should cite Bond & Bergstrom's (2005) review paper reporting 7.5 m2/g

Delene and Ogren (2002) showed similar results for a number of the analyses in this paper, including the systematic dependence of aerosol intensive properties (single-scattering albedo, backscatter fraction) on scattering coefficient. They also showed how the Ångström exponent varied systematically with the submicrometer scattering fraction, similar to the PM2.5/PM10 fraction that Pandolfi et al evaluated. It would be useful to compare the results from MSY with the results from the four stations reported by Delene & Ogren.

There is a large body of work on aerosol mass scattering efficiency, and the paper should include citations and comparisons with the previous work.

Previous studies (e.g., Delene and Ogren, 2002) have used B/S ratio, and this is the first time I"ve seen an analysis using S/B. Given that B can be quite small, it makes more sense to put it in the numerator to avoid dividing by a small (and noisy) number. It also makes more sense because climate forcing calculations use the upscatter fraction or asymmetry parameter, which can be derived from the backscatter fraction.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 14091, 2011.