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Interactive comment on "Aerosol mass closure and reconstruction of the light scattering coefficient over the Eastern Mediterranean Sea during the MINOS campaign" *by* J. Sciare et al.

J. Sciare et al.

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The authors acknowledge the reviewer #2 for his/her positive review of the manuscript. Following his/her recommendations, corrections have been done in the revised version of the paper.

Minor remarks/questions of referee #2

+ "Section 2.1 There is reference to unpublished data from Minikin et al. about two aerosol layers. Are there no published data on the layers available from the large MINOS data set?" Nothing has been reported yet on the vertical distribution of aerosols during the MINOS campaign. To our best knowledge, the two layers have been only

reported for aerosols and were not clearly observed from gas measurements.

+ “Section 4.4: To my knowledge (I’m not a filter sampling expert); NO3 is known to evaporate easily from filters (...). Does this affect the presented data?” Associated with ammonium, nitrate is indeed a semi-volatile species that can easily evaporate during filter sampling. Ammonium nitrate is usually found in the submicron range. In the study, nitrate was mainly in the supermicron (coarse) mode and associated with sea salt and/or dust aerosols (subsequent volatilization of HCl if associated with sea salt; associated with calcium for dust aerosols). In this case, nitrate is not volatile and will be collected in a quantitative way on our filters.

+ “Sector 5.4. The factor analysis would benefit of a more detailed explanation ...” We do agree with the referee that the point dealing with carbonaceous aerosols is rather vague. For this reason, we have brought some changes on this point in the revised version. Note that Sciare et al. (2003b) have shown that BC (from 2-step thermal method) was correlated with nss-SO4 (anthropogenic tracer), whereas BC (from thermo-optical method) was better correlated with nss-K (biomass burning tracer). This result is not connected with BC/nss-SO4 ratio (which is normally not conservative), but aims to demonstrate that different BC analytical methods will lead to different results (different aerosol sources). In the results presented here, the BC data are those obtained from the thermo-optical method. It shows (from the Factor Analysis) an exclusive biomass burning source. In a sense, it is in line with the conclusions drawn by Sciare et al., 2003b. On the other hand, it does not reflect the fact that carbonaceous aerosols are also originated from anthropogenic activities.

+ Figure 2: “couldn’t the size distribution of BC and OC be included in Figure 2 ?” Mass size distributions of BC & OC have been already reported in Sciare et al. (2003b). That is the reason why we did not put them again in this paper.

+ Typos: Corrections done in the revised version of the manuscript

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 2427, 2005.