

Interactive comment on “Variability in regional background aerosols within the Mediterranean” by X. Querol et al.

W. Aas (Referee)

waa@nilu.no

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The paper gives a nice overview of the pollution level of aerosols and its spatial and temporal distribution in the Mediterranean area. I do however miss some more in depth evaluation of the quality and comparability of the data. More specific comments

Chapter 4.1.1 Not specific on the when the average value for Ayia Marina in Cyprus is valid. The annual average of PM10 mass ranges from 28.8 $\mu\text{g}/\text{m}^3$ in 2005 to 33.7 in 2006 (EMEP status report 4/2008)

Are the data really comparable when different year are used in this study? Depending on the influence of Sahara dust episode there may be relatively large inter annual variations. Some discussions on the variety of the averages are needed to compare

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the datasets. Furthermore, the methodologies for mass measurements are different. TEOM is used at Cyprus and this may underestimate compared to gravimetric method.

Figure 2. Caption is misleading since the diurnal cycle at EMB is not calculated using all the data. The caption should contain all relevant information since many people only look at the figures and don't read the whole manuscript.

Chapter 4.1.2. When discussing the chemical composition it is necessary to also include some elaboration of the uncertainty. NH_4NO_3 loss as well as artefact in the EC/OC needs more attention.

Are the data from the different sites as well as the other European measurements comparable? There are differences in methodology as well as different artefact problems due to different chemical composition in the atmosphere and different meteorology.

For EC/OC it could be valuable to include the data from a complete dataset using same method all over Europe (Yttri et al ACP 2007, 7, 5711-5725). However the conclusion of relatively low OC compared to south and central sites in Europe is still relevant. Same is true for EC. But some comments on why would be interesting. Can it be an artifact or is there some explanation of different emission sources. Somewhat puzzling since Ispra in Northern Italy has very high OC level (7-10 μg from 2003 to 2006 from the EMEP status report 4/2008), but this site is very much influence by the Po area. However the Portuguese site Braganca has a level of 4 μg (2002-2003), which is a bit higher than seen in this study. Same is true for Montelibretti in Italy (EMEP PM assessment report)

Table 1. Melpitz has also measurements of EC/OC. 2006 data found in EMEP status report 4/ and Birkenes has measurements for both PM₁₀ and PM_{2.5}. And Birkenes is a site in Norway not Finland. The mineral dust data is not always comparable because at several sites this is only sum of Ca and K since Si and Al is not always analyzed. However, one may look at the unaccounted mass to state that the mineral dust is not on the same level as for the sites in this study. Should be separated however so there is no confusion whether one compare the same things. Would be useful to include Italy

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(e.g with Montelibretti) by Perrino et al in the EMEP PM assessment report, since also this site experience frequent Sahara dust episodes and they use denuder for NO₃ and NH₄ measurements showing that it can be big loss of NH₄NO₃ on regular PM filters.

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