

## ***Interactive comment on “Size resolved mass concentration and elemental composition of atmospheric aerosols over the eastern Mediterranean area” by J. Smolik et al.***

### **Anonymous Referee #2**

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This paper presents measurements of size resolved chemical aerosol composition carried out at the surface (ground based station and vessel) in the Eastern Mediterranean basin during 3 weeks in summer and 1 week in winter. The discussion is mainly focused on the sources and /or origin of the sampled air masses.

The data are probably of high quality and clearly contribute to better assess the composition of atmospheric aerosol in the Eastern part of the Mediterranean Basin.

However, the discussion should be reinforced since in several occasions, there is a mixing between well established conclusions and possible explanations. I strongly recommend that a special attention should be given to clearly distinguish between these two different types of results in order to avoid any ambiguity for the readers. The

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authors should thus be more careful in their interpretations, according to the details given hereafter.

### Specific comments

1- No analytical precision is provided for the gravimetric analysis and for the Pixea analysis. For gravimetric analysis, the various sets of samples were not weighted in similar conditions for humidity (from 56 to 63%) and temperature (21 to 27°). What is the impact of that on the precision of the measurements and on the comparison of the mass collected for the different data sets ?

2-Statistical treatment : about 30 samples have been collected and 17 parameters are considered. Are you sure that the system is not under documented for such an analysis? In table 2, it is surprising that the eigenvalue and the fractional variance are lower for factor 2 than for factor 3 (generally, in factor analysis, the eigenvalues are decreasing with factor numbers). The authors should be precise when they discuss the results of the varimax analysis : it is not completely correct to write that the 60% of variance explained by crustal and marine influence indicated a greater influence of natural sources compared to anthropogenic ones in the region. This statement is only valid for the elements that constitute your data set: if you remove some crustal elements and add some anthropogenic ones (for exemple carbonaceous aerosols), the respective weight of the factors will be changed. Thus, your conclusion is only valid in reference to the elements considered in your data set. This should clearly indicated.

3- Why Si does not appear in the list of elements associated with crust (p 2256, line 28-29) ?

4- the discussion on K is not demonstrative. No real elements showing links between these measurements and wood combustion is provided. This part should be written differently : the results suggest a wood origin but do not demonstrate really this origin.

5- the same comment can be applied to the chlorine discussion : nothing allows the

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authors to state that the observed chlorine concentrations depend on distant source strength and long range transport to Crete. This is only a most probable explanation and it should present in this form.

6- table1 : add standard deviations.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 2547, 2003.

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