We thank the reviewer for his productive comments that helped us improve the contents of the manuscript. All issues raised are hereby one by one addressed.

P 28276, lines 13 and 14: High aerosol columnar contents are not always linked to elevated surface levels of particulate matter. Numerous studies (including over Greece) have shown that aerosols (such as mineral dust but not only) can be transported in elevated layers.

Rephrased accordingly.

P. 28278, line 23: Please correct the Beer-Lambert-Bouguer law

Corrected

P. 28279, line 26: How is the contribution of the Rayleigh scattering calculated before being subtracted from the AOD?

The contribution of Rayleigh scattering (and of ozone absorption) are subtracted from the total optical depth (τ) in order to calculate the aerosol optical depth (AOD). The wavelength dependent optical depth of Rayleigh scattering is calculated from the formula of Hansen and Travis (1974) using a time series of pressure. The ozone optical depth is extracted using the ozone absorption coefficients for each wavelength and the total column of ozone. Please see Gerasopoulos et al., 2003 for details and references therein.

P. 28281, lines 19 to 24: The authors mention that the AOD spikes are generally associated with low values of the Angstrom exponent. This is relatively difficult to see on Fig.1. I suggest adding a plot of the Angstrom exponent against the AOD, which would immediately show that at least a significant fraction of the large AODs are due to coarse aerosols (probably mineral dust) (see El-Metwally et al., JGR, 2008, and references therein).

The plot has been added as suggested and appropriate rephrasing has been included.

P. 28282, line 7: I agree that the 'spring mode' is most certainly due to the advection of mineral dust from the Sahara. Regarding the summer mode, it might be due in part to advection of polluted airmasses from the north but could not local photochemistry also play a role in its building up?

At this particular paragraph we are discussing about the different contribution of the two modes (spring and summer) in the overall seasonal cycle along the two directions of the South-North axis. Since we do not expect different potential of photochemical activity within the extended area, we have not referred to its role in the building up of particles. This is because it could not possibly explain the change of the seasonal characteristics along the north-south axis. However, we agree that as a process it contributes to the building up of particles mainly during summer, so we have included some additional explanation on that.

P. 28283, line 20 and following: the authors explain the increase of the AOD during *the day by a combination of aerosol source/processes whose activity follows a diurnal cycle and by meteorological factors -especially in spring and summer when prevailing winds blow from the west towards the experimental site all day long and not just after approximately 9AM like in autumn or winter. What could explain that the afternoon peak of the AOT cycle is much more pronounced in autumn than in the other seasons? Is this just result of the fact that the 'mornings' are relatively clean and that in comparison the afternoon deviation of the AOT from the average situation seems larger?*

That is exactly the case. We have investigated absolute seasonal AOD values instead of AOD departures and compared mornings and afternoons between the two seasons. It is clearly revealed that autumn mornings are much cleaner that summer ones, while afternoon values are at the same level. This additional information has now been included in the text.

P. 28284, line 15: What is the numerical criterion used for separating "short' from 'long' trajectories in the various classes?

There has been no particular numerical criterion. The results of the cluster analyses were clear at the point that from the same direction there were two clusters of trajectories, one shorter than the other. Of course the reviewer has a point here by means that the short class e.g. from NE are shorter than the short class from NW and the long class from NE might be comparable in length to the short from NW. So the answer to this is the distance from main sources and whether the origin of the grouped air masses is above polluted or relatively cleaner areas. Some rephrasing for clarifying this issue has been included.

Fig.5: On the maps, there seems to be significant overlapping of the arrows labeled C corresponding to clusters 1a and 2. Is there really a difference between the two? Same question for arrows A from classes 1a and 3. Couldn't the total number of clusters be further reduced?

The reviewer is right. Some of the arrows do give that impression of overlapping which however has to do with the size of the arrows and their plotting on the maps. The cluster analysis has well separated between the mentioned classes and this can be seen clearly in their significantly different characteristics (Table 2). We have now redrawn this figure to avoid such misunderstandings.

P.28288, line 10: Some of the "stagnant" trajectories" visible on figure 5 seem to have travelled over the Sahara. In this case, it cannot be excluded that the relatively low value of the Angstrom exponent (1.2) could be due to the presence of mineral dust and not just to marine aerosols.

The percentage of trajectories which are in contact with the African continent (also as seen in previous version Fig. 5) is very small and in all cases they do not travel over the Sahara, just could bring some air parcels from over the coasts of Egypt, where we should additionally make the assumption of preexisting suspended dust. Moreover, under stagnant conditions, low winds dominance is not expected to favor transport processes. Finally, dust related average angstroms have been much lower, so that we would expect enhanced standard deviation in this cluster (see Table 2).

P.28289: Similar comparisons of the MODIS and AERONET AOTs for the different seasons have already been made for the city of Cairo (El-metwally et al., Atmospheric Research 97, 14–25, 2010). These authors also found that 1) MODIS generally tends *to overestimate the sunphotometer reference optical depths, 2) the best agreement between MODIS and AERONET is obtained in winter when the aerosol load is dominated by local pollution sources, and 3) an overestimation of approximately 30% is observed when aerosol sources external to the city (Saharan dust or biomass burning aerosols from the Nile delta) are active. I suggest mentioning this earlier work with whom your results perfectly agree because it could only strengthen your own conclusions.*

We thank the reviewer for his valuable contribution in this issue. Following his suggestion we added the text below:
"Our results are in general agreement with El-Metwally et al., (2010), who showed that MODIS generally tends to overestimate the sunphotometer reference optical depths over the city of Cairo, Egypt. They find a fairly good agreement in winter (ratio close to 1, but still overestimation), and an overestimation of the AOD by MODIS larger than 40% in spring and autumn (still high in summer months). They have attributed this tendency to the inappropriate adaption of the aerosol model for inverting the MODIS radiances measurements in the desert dust and biomass burning periods, and a possible worse parameterization of the reflectance of the desert-like soil surface.
In Athens case, the comparison results are somewhat better, since the second reason is not the case, however, indeed overestimation coincide with periods of dust transport (around 10% in spring) or smoke transport from biomass burning (around 30% in late summer)."

P.28290, line 20: The authors claim that a negative value of the difference of angstrom's exponents calculated over the 440/675 and 675/870nm ranges is indicative of the dominance of coarse dust particles. Isn't this contradictory with the fact that a significant number of negative values of this difference correspond to cases for which the Angstrom exponent is larger than 1.5, and even 2? At such large values of the Angstrom exponent a submicron mode must clearly be dominating the aerosol properties.

Our claim, as mentioned in the text some lines above this statement, is limited to the cases of fraction contribution (n) of the fine mode to the AOD <50%. From the respective figure it is obvious that this part of the figure corresponds to Angstrom exponents lower than 1, so our argument was not meant to be general for the whole range of negative Angstrom differences. However, we rephrase to clarify this issue since it has also been a comment from reviewer 2.