

Reviewer 1 Comment

From my initial read of the text, this manuscript has the potential to be an interesting paper in ACP, but unfortunately the presentation of the figures is so poor that I am unable to evaluate the analysis. The authors will have to completely revise and condense their figures before I can make a recommendation to the editor.

This paper has 21 figures with a total of 133 panels, 90% of which are too small to be read. This is a result of the authors' poor formatting and visual display, coupled with ACPD's inadequate page layout which routinely makes figures far too small (I complain about this often). Any ACPD paper should be legible when printed onto paper, but for this paper, I can only make out the text in the figures by literally blowing up each panel on my laptop to 300% and then peering very hard to make sure I understand the highly pixelated text. I am not prepared to review a paper such as this when there are over 100 tiny panels.

I also find the figure production to be below the standards of the journal. The authors did not produce the figures of the meteorological fields. All they did was go to the website of the NOAA/ESRL Physical Sciences Division and use the web-based plotting tool to make figures using coarse resolution NCEP reanalyses. While the figures from this website are fine for discussion of a paper when it is in draft form, they are not adequate for ACPD. The text is far too small and the color schemes are terrible and very difficult to interpret. This website also produces the data for each plot in a simple text file that can be used by the authors to plot the figures in a more visually appealing and understandable format, but they chose not to do so. Why did the authors choose to use the NCEP 2.5 degree data to investigate regional scale transport patterns over the Mediterranean? As EU scientists these authors have free access to the superior ECMWF data, which are available at much higher resolution, far more appropriate to this regional scale study. The authors need to switch to ECMWF data and plot it with a resolution of at least 1 degree, preferably with a resolution of 0.5 degrees, if they are to properly understand the regional scale transport patterns. This is especially true for vertical velocity which is essentially useless at 2.5 degree resolution.

I have the same criticisms of the HYSPLIT trajectories. The figures were not produced by the authors but simply taken from the HYSPLIT interactive webpage. When they were pasted into the manuscript they were shrunk vertically so that the aspect ratio is all wrong. The authors need to get the trajectory data from the website and plot the trajectories in a legible format.

I have similar complaints about the rest of the figures, except for figures 1, 20 and 21. When the authors revise their figures they also need to greatly reduce the number of panels. No one wants to sit down with a paper and read through over 130 panels.

Authors Response (in Italics)

We would like to thank the reviewer for his comments, which help improving the paper.

At first, we would like to express our surprise for the strong criticism of the reviewer towards NOAA/ESRL charts as we had already used them in the same form previously, without any objection, in at least 4 papers, which are included in the list of references: 2 in Atmospheric Chemistry and Physics (Kalabokas et al., 2007; 2013), 1 in Atmospheric Environment (Kalabokas et al., 2008) and 1 in Tellus B (Kalabokas et al., 2015).

Following the reviewer's suggestion, we tried to replace the NOAA/ESRL maps to the corresponding ECMWF maps. It appears though that the ECMWF web-page does not offer corresponding possibilities for producing composite charts. So, we relied to software developed at the LISA-Paris laboratory for the production of Figures based on ECMWF data.

It turned out also that we could not produce temperature anomalies and specific humidity anomalies based on ECMWF data. It was possible to produce composite charts of geopotential height, wind speed and omega at the 900 and 800 hPa pressure levels, shown in new Figs 3 and 8 for the April and May episodes respectively. In the new Figs 2 and 7 the composite charts of all examined meteorological parameters are presented at the 850hPa pressure level, based on NOAA/ESRL data, but they were plotted by using the same plotting tool as for the ECMWF maps, which was the initial suggestion of the reviewer. As observed, both chart types (ECMWF and NOAA/ESRL) show more or less the same patterns, which suggests that for the examination of high ozone episodes the choice of meteorological map type does not influence the used argumentation. In any case, the original NOAA/ESRL plotting format does not appear in the main Figure list, according to the reviewer's suggestion..

We also improved the layout of the HYSPLIT back-trajectories by using the maximum available plot resolution from the web-page, since we do not dispose another alternative. We also corrected the aspect ratio of these charts following the reviewer's suggestion.

We also proceeded to a substantial reduction of Figs, as it was suggested by the reviewer. With these arrangements the number of Figs in the Figure list is reduced to 11 and the number of panels is reduced to 52 (more than 50 % reduction). We also decreased the number of panels per page for easier reading. On the other hand, we just created an Annex (as it was also suggested by reviewer 2) for shifting there some of the Figs, which might be interesting for some readers.

Following the above arrangements the paper has been restructured, as seen in the attached revised version, and we believe that the reviewer's requirements are now fully fulfilled.

The corresponding changes in the revised manuscript are highlighted in yellow color.