Author's response to referee #2

The authors are grateful to the anonymous referee #2 for his/her time devoted to this paper and the useful comments and suggestions, aiming at the improvement of the manuscript.

All comments and recommendations of referee #2 were taken very seriously into consideration for the preparation of a revised version of the manuscript. Additional effort has been put in order to implement suggestions and incorporate them in the manuscript to the best possible degree and prepare a revised version accounting for all comments of referee.

In the following, we present our answers to the comments of referee #2 as well as the changes performed in the manuscript in the following order:

A. Comments of referee #2

B. Authors' answers to each comment of referee #2

C. Changes in the manuscript to account for comments of referee #2

A. Comments of referee #2

General:

The study uses the long-time visibility records along with meteorological variables,emissions and satellite optical depth retrievals over Athens and explores the relationships between these variables over three distinctive sub-periods. The manuscript is clear, well-written with a very good introduction. However, I find the conclusions too long and can be substantially reduced by only pointing to the major outcomes of the study.

Minor comments

Line 237: How far from Athens? Characteristics of the site (emission sources etc)?

Lines 248-254: Better to present the trends in uniform units, per year in this case.

The resolutions of the excel-based figures should be improved.

The relation (zooming) between the two plots in Figure 1 is misleading.

Figure 7: Precipitation Height is misleading, drop the "Height"

Figure 13: Why the different bins have different widths? Does it stand for something?

For instance why 0-0.5 km bin is largest? Please explain.

Figure 15: Can you also add the data for Athens here?

Technical corrections

Line 33: Remove the comma before (WMO, 1992).

Line 38: Replace "at" with "over"

Line 55: : : :. pollutant emissions: : :.

Line 231: Correct as (Kanakidou et al., 2011)

Line 260 and 272: Correct "to 1 km" to "than 1 km"

Lines 261, 266 and 272: Correct "to 500 m" to "than 500 m"

Line 290: ..results IN improvement: : :.

Line 345: Change "as regards" to "regarding"

Line 408: : : :. ARE due to local factors: : :

Line 423: : : :.in accordance WITH: : :

Line 475: INDEPENDENT of the location: : :.

B. Author's answers to the comments of referee #2

General comments

Section 4 summarizes the findings of the study but also discusses in detail linkage/attribution between the main results of the analysis and possible causes. For this reason, this section is long enough. However, the section was reduced in an effort to focus on the main findings of the study and also avoid duplications.

Minor comments

Line 237: Additional information for the reference station of Finokalia (Crete) was included in the text (see changes in the manuscript, below).

Lines 248-254: This was now corrected in the manuscript.

Some of the excel -based figures were reproduced using a different graphical tool. When not possible, the resolution of excel- based figures was increased.

Indeed, the zooming between the two plots in Fig. 1 is not successful. Fig. 1 was recreated (see below, changes in the manuscript).

Fig. 7: The figure was corrected

Fig. 13: The bin widths are based on the WMO definition on visibility class index. They are not equal as visibility in km and WMO visibility index does not have a linear relationship. The XX' axis is logarithmic.

Fig. 15. PM10 for two stations in Athens from 2004-2014 were added in the figure (see below, changes in the manuscript)

Technical corrections

Although a grammatical editor had already been used, for some reason it didn't work properly and a number of grammatical and syntax errors remained in the text. Additional effort and a new editor have been used now to cope with this problem. All suggested technical corrections were applied in the text.

C. Changes in the manuscript to account for the comments of referee #2

General

The length of section 4 was reduced in the manuscript. The discussion focused on the main findings of the study and duplication of information or extended analyses were avoided.

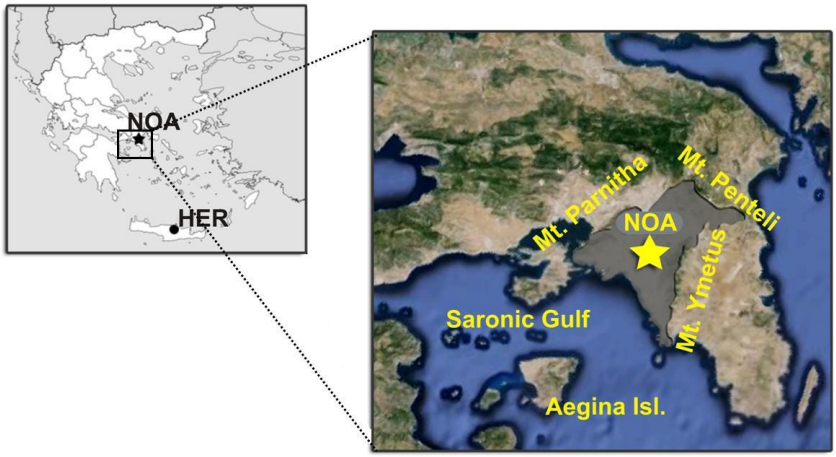
Minor comments

Information for Finokalia station is added in the manuscript: The Finokalia station (35.240° N, 25.600° E) is located on the Northern coast of Crete, Greece, at a distance of approximately 320 Km to the south of Athens. There is no significant human activity within an area of approximately 15km around the station, mainly characterized by a scarce vegetation. The closest large urban area is the city of Heraklion (HER), (see map. of Fig. 1) with 150 000 inhabitants, and located 50 km West from Finokalia. Aerosols at the site are mainly transported from the Southern-Eastern Europe and Northern Africa, and to a lesser extend from central and western Europe (Kouvarakis et al., 2000; Mihalopoulos et al.,1997).

Lines 248-254: The trends of visibility were now expressed as km yr^{-1} in the manuscript.

Some of the excel -based figures were reproduced using a different graphical tool. When not possible, the resolution of excel- based figures was increased.

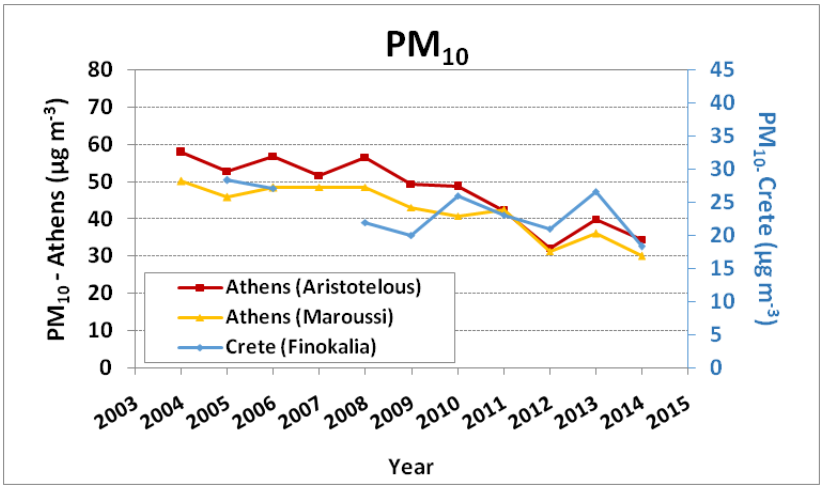
Fig. 1 was reproduced with a proper zooming.



New Fig.1. Map of the study area in Greece, including the Athens urban station (NOA) and a reference, non-urban station (HER) at Heraklion airport, Crete. The gray surface represents the boundary of the Greater Athens Area (GAA).

Fig. 7: The word 'Height' was dropped.

Fig. 15: The figure was recreated including annual PM10 values for the two stations of Maroussi and Aristotelous in Athens.



New Fig. 15. Variation of the annual PM10 concentrations at the reference station of Finokalia (Crete) over the period 2005-2014 and at the stations of Maroussi and Aristotelous in Athens (2004-2014).

Technical corrections

Technical corrections suggested by referee #2 were applied in the manuscript (Lines 33, 38, 55, 231, 260, 272, 261, 266, 272, 290, 345, 408, 423, 475)

Additional syntax errors were also found and corrected.