Author's Response to the third round of review for the manuscript **"Aerosol optical properties over Europe: an evaluation of the AQMEII Phase 3 simulations against satellite observations (acp-2017-1119)"** submitted by Laura Palacios-Peña

Report #1: Anonymous Referee #1

Suggestions for revision or reasons for rejection

Q: [A discussion of several underestimation / overestimation issues at certain areas and seasons is going on throughout the paper but there is no explanation related to the atmospheric chemical and physical processes behind these issues…] [The authors should be aware of and use the relevant MODIS products for their comparison. Also, a robust AOD and AE study should consider comparison with AERONET stations which is not present here.]

A: However, we honestly believe there was a little misunderstanding at this stage of review. We were a little bit surprised about Referee #1 comments, because he/she states that there is no comparison with AERONET stations. They were not included in the original submission, but after the first review most of the revised manuscript is devoted to the evaluation of modelling results against MODIS and AERONET observations. The comparison with AERONET was pervasively included in the submitted revised version of the manuscript, as stated in the abstract (page 1, line 10), methodology (page 8, line 29; page 9 and 10), results (page 11: "The numerical result of each case for MODIS (M) and AERONET (A)" and discussion thereafter)". All the Figures include the validation against AERONET stations, and even in the text in the figures we indicate the mean error when compared with AERONET (A). Also, an explanation of the relevant physico-chemical processes is included at the final part of discussion and in the conclusion.

We honestly believe there was all a misunderstanding and the reviewer read the previous (initial) version of the manuscript, which did not include AERONET validation, because all his/her comments are addressed in the revised version we submitted in October.

Report #2: Anonymous Referee #3

Suggestions for revision or reasons for rejection

Q: The authors have greatly improved the manuscript by following the recommendations from the second revision. The text now reads very well as the language has been improved as well. I have only minor, mostly grammatical, edits that are shown in the list below and I recommend minor revision before publication.

1. Page 1, line 8: replace "remote sense data" with "remote sensing data". Done

2. Page 1, line 16: replace "model election" with "model selection". Done

3. Page 5, lines 13 and 20: please remove the phrase "so-called" in both parts of the text. Done

4. Table 1: the 5th column has as a title the letter "c"; also sometimes "diagnostic" is mispelled as "diasnostic". Please correct. Done

5. Page 8, line 6: "Moreover, in order to conduct a reliable...". Done

6. Page 9, line 12: "rationing" the equation is not an appropriate term. Maybe use "partitioning" instead. Done

7. Page 10, line 10: in the parenthesis "as the ones used in https..." Done

8. Page 10, line 17: correct "spacial". Done

9. Figure 1: explain the difference in the map vs. circles in the figure caption. Corrected caption: "Total and under the mask number of observations used in the analysis. Maps show the number of MODIS observation and point the number of AERONET observations."

10. Page 12, line 8: replace "time means" with "temporal means" or "temporal averages" Done

11. Page 12, line 25: "this affected also the number of..." (remove "to") Done

12. Page 13, line 19: "when versus both MODIS..." does not make sense. Please edit accordingly. Replaced by: "when compared versus both MODIS and AERONET".

13. Page 14, line 27: "seriously the ENSEMBLE..." (remove "in"). Done

14. Page 19, line 30: replace "demanded" with "necessary" or "appropriate". Done

15. Page 21, line 6: please correct "band quiet crudely...". Corrected as "band quite crudely"

16. Figure 2-7: explain in the figure caption the values shown in the insert of every plot (i.e. MAE(M)=0.36, MAE(A)=0,46). In order to clarify, this sentence has been included to captions: "Values in every plot indicate the spatial and temporal average of MBE for MODIS (MBE(M)) and AERONET (MBE(A))."

   A: We really appreciate the kind reviewer's #3 comments. We have revised and corrected point-by-point all his/her edits.