

**Response to:**

Editor Initial Decision: Publish subject to technical corrections (09 Feb 2015) by Annmarie Carlton

Comments to the Author:

Please incorporate several technical/editorial type corrections (below) that I think will improve the manuscript.

**Dear Editor,**

***we thank you for carefully reviewing our manuscript and sending us your comments, which we integrated in the revised version. And thanks for considering our work suitable for publication on ACP. We attach specific responses here below.***

Page 17, Lines 31-32: Can the soil dust erosion and resuspension idea be supported with a wind/PM10 relationship or correlation?

***We revisited this particular aspect of our simulation, and found no significant correlation between the difference PM10-PM2.5 and wind speed, in both observations and model. Thus, we cannot support our claim as suggested by the editor. We actually wanted to point out here a possible missing coarse aerosol source from soil erosion and resuspension caused by traffic (not wind), a very uncertain process which is not explicitly represented into the model. We added “caused by traffic” in order to clarify the statement.***

Editorial:

Page 2, Line 12, Line 19: the “2.5” in PM2.5 is not subscripted here but is elsewhere in the manuscript. At other places in the manuscript, the number is not subscripted again. My personal preference is subscript, but I will defer to the authors so long as you are consistent.

***We changed the notation to the subscripted version throughout the manuscript.***

Page 6, Line 12: “firstly” should be capitalized.

***Done.***

Page 6, Line 16: “this” should be “these” because it is referring to the plural “questions”

***Done.***

Page 6, Line 19: summarized is spelled incorrectly

***Corrected.***

Page 6, Paragraph from Lin 12-19: the authors interchangeable use the past and present tense. The tense should be consistent in the paragraph and throughout the manuscript.

***We changed everything to present tense.***

Page 13, Line 29: I think there is a typo or word missing in "...and stay above 2 m/s also nighttime"

***We added "it" before "stays".***

Page 17, Line 1: "onnnly" is spelled incorrectly and the 2nd "only" in the sentence should be removed

***Done.***

Page 17, Line 5: I suggest changing "not well" to "poorly"

***Done.***

Page 17, Line 7: is this the wind speed at 10m? If so, I suggest writing "wind speed at 10m is overestimated ..."

***We added "10 m".***

Page 17, Line 10: please define RMSE

***We added "Root Mean Square Error (RMSE)". The mathematical definition is given in the appendix as mentioned previously in the paper.***

Page 17, Line 14: please remove "quite"

***Done.***

Page 17, Line 16: I suggest rephrasing for clarity from "...does not show a tendency neither to underestimation nor to overestimation, while ...." to "...does not show a tendency to underestimate nor to overestimate, while ...."

***Done.***

Page 17, Line 28: change "leans" to "lends"

***Done.***

Page 18, Line 11: can “smooth trend” be described more quantitatively? Do the authors mean there is little variability?

***Correct, we mean little variability. We changed “...a relatively smooth trend” to “little variability”.***

Page 18, Line 31: “however, in first...” should be changed to “however, a first...”

***Done.***

Page 20, Line 5: Can the authors describe the “peculiar” profile in less colloquial terms? Is it that the vertical profile is substantially different, driven primarily by aloft concentrations, compared to other species?

***We changed “... a peculiar profile,” to “... a profile substantially different compared to other species,”***

Page 20, Line 19: The sentence would be easier to read if “emission” was before “and” or move “and” to after “dry deposition”

***We moved “emission” at the beginning of the list, and kept the “and” before “dry deposition”. The reason is that “turbulent mixing and dry deposition” are tightly coupled in WRF/Chem model formulation, indeed we couldn’t separate the two terms in the budget analysis (as stated elsewhere in the manuscript, page 12, line 9).***

Page 20, Line 21: change “will not be shown” to “are not shown”.

***Done.***

Page 21, Line 4: “Similarly” should be “similar”

***Corrected.***

Page 22, Line 18: “...so far reveals of a complex ...” Please remove the “of”

***Done.***

Table 1. There are numbers in 2 columns. It’s not clear they are supposed to be there. If they are intentional, more explanation is needed.

***No, they are not intentional, and probably inserted by mistake. We removed them.***

Table 2. There are numbers in 2 columns. It’s not clear they are supposed to be there. If they are intentional, more explanation is needed.

*Idem.*

Figure 5. Only one set of observations is listed in the legend Please list both.

*We changed “...for daily and bi-daily ...” to “...for daily (solid lines) and bi-daily (dashed lines) ...” to clarify how the two dataset are presented in the figure.*

Figure 6. Please put a note in the caption that the color/mass concentrations scales are by approximately a factor 2. Also please define the white dotted line the caption and explain if it modeled or empirical.

*We added “The white dashed line in the bottom panel denotes the simulated PBL height.”. However, we haven’t understood the first comment, and haven’t made any further modification. If the editors meant that the bottom panel color scale (which goes from 0 to 30) is approximately twice that of the top panel (which goes from 9.5 to 13.5) this is not true, since the top panel’s colorbar starts at 9.5, not 0.*

Figure 8. Are the WRF levels really defined by elevation in meters, or is it a pressure definition? Please define the depth of the model’s surface layer.

*WRF has eta (pressure) levels. We added “approximately” before “750 m” and echoed the information on the depth of first model level given on page 11, line 5 adding “(the first model level is about 24 m thick)”.*

Non-public comments to the Author:

I think this is exciting work and look forward to final publication.

*We thank the editor for the appreciation of our work, we enjoyed doing it and we hope it could spin new interesting research on the aerosol vertical profile.*

*Best regards, the authors.*

Best regards,

-Ann Marie