

Response: We thank the reviewer for the constructive comments to help us continue to improve the manuscript. Please see the detailed responses to your comments below.

Minor:

1. In the response to my comment on PM<sub>2.5</sub> removal, it is stated that dry and wet deposition contribute to 12% and 13% of the total removal over NCP in December 2015 and January 2016, respectively. I am confused by this statement, since aerosols are mainly removed from atmosphere by dry and wet deposition. Could the authors elaborate on the process analysis? What are the other processes that contribute to PM<sub>2.5</sub> removal?

Response: We have added more information about the process analysis.

“In addition, we applied the process analysis (Kwok et al., 2013), including horizontal and vertical transport, gas phase chemistry, aerosol process, cloud process, dry deposition and emission to investigate the effect of different processes on PM<sub>2.5</sub>. The dominant PM<sub>2.5</sub> enhancement processes in both December 2015 and January 2016 are emission and aerosol processes. Regarding the removal process, the dominant process is the vertical transport, followed by the dry and wet deposition (inferred from cloud process). Both the dry and wet deposition contributed a total of 12% to the total removal processes over NCP in December 2015, comparable to that (13%) in January 2016, indicating the seesaw pattern was not modulated by the deposition.”

Technical corrections:

1. Lines 103-106: The summary of Section 3 is missing.

Response: This has been added in the revised manuscript.

2. Line 246: Remove “The black box in Fig. 3a indicates the area of NCP” since no black box is plotted.

Response: This has been removed.

3. Line 349: Should “January 2013” be “January 2016”?

Response: Right, thanks for pointing out the typo.

4. Line 384: Change “shift” to “shifts”.

Response: This has been changed.

5. Fig. S6 caption: Change “indicating” to “indicate”.

Response: This has been changed.