

Interactive comment on “Atmospheric wet and dry deposition of trace elements at ten sites in Northern China” by Y. P. Pan and Y. S. Wang

Anonymous Referee #1

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The authors report measurements of atmospheric dry and wet deposition of trace elements in ten sites in the North China Plain area which have experienced serious air quality problems associated with intensive agricultural and industrial activities. The results of this paper are quite interesting.

The authors investigated the relative importance of wet and dry deposition in the removal of airborne trace elements and combined contribution of wet and dry deposition to ecosystems in the region. This will help researchers improve the understanding of the transport of air pollutants from sources to the environment. The findings are important for model validation and are also helpful for policy makers to create legislation to reduce the emissions and protect soil and water from air pollution. Overall, the paper is well presented and straight-forward. I can recommend publication, once the authors

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address the comments below.

Page 20648, Line 20-25: Should the author give the full name when he/she first mentions the chemical species? Please carefully check the whole manuscript.

Page 20651, Line 19: In the results and discussion part, the author talked about TEs related to local emissions. Could the author add a paragraph in the introduction to briefly introduce the sources of TEs in the atmosphere? What TEs were from human activities and what TEs were from natural sources?

Page 20651, line 24: It would be better to move figure S1 in the Supplement to the text for the readers' convenience.

Page 20652, Line 15-20: I noticed this automatic collector was only used in the authors' research group. If this sampler has been used in other studies or in different research groups, please cite one or two of their papers.

Page 20653, Line 10-15: If the authors used the same sample treatment procedures as others, please cite one or two papers.

Did the author conduct duplicate sampling such as setting up two samplers at one site during the measurements? If the author did this, please include the data in the manuscript. If not, I highly recommend thinking about this in future studies.

Page 20656, line 21: I suggest the authors move Table S1 (also S2 and S3) in the Supplement to the text for the readers' convenience. Otherwise, please add the 10-site mean values measured in this study in these tables for comparison.

Page 20659, Line 18: Dust storms are a regional transport episode, but the author only mentioned impacts at the BJ site. Did the author find any evidence indicating impacts of dust storms on the other sites in this region?

Page 20659, Line 23: Beijing is also a coal consumption city during the winter. Did the author find evidence of this at the BJ site? If not, please explain why.

Page 20660, Line 19: If the wdfPb was much higher than other places, please explain what are the major sources of wdfPb in this region?

Page 20662, Line 7: Is there any report of long-range transport effects on wet deposition flux of TEs? The author should add more discussion on this point. The author only mentioned "upwind areas". Is it long-range transport from urban and industrial areas or rural areas?

Page 20664, Line 15: Please cite the paper which partially verified this pattern in Northern China.

Page 20667, line 3: I suggest the authors add a figure to show the vertical profile showing the distribution of Mc for each metal vs. soil depth, which will be helpful for the readers to interpret the ideas examined here.

Page 20667, line 27: Also, it is better to move Table S4 in the Supplement to the text for the readers' convenience.

Page 20674, Table 1: It would look better if the author can add several black lines in Table 1 to clearly separate the urban, industrial, suburban, agricultural and rural groups.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 20647, 2014.