

Interactive comment on “Trace metal characterization of aerosol particles and cloud water during HCCT 2010” by K. W. Fomba et al.

Anonymous Referee #2

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This manuscript presents and discusses trace metal data for samples that were collected in September–October 2010 at the top of the Mt. Schmücke mountain site and at two stations upwind and downwind of Mt. Schmücke. The data are related to each other and to some extent compared with previous data from the same site and other rural sites. Attempts were made to assess the sources of the various trace metals. Although the data analysis is rather standard, the interpretation is fairly convincing.

As discussed in detail below, the manuscript is on a few occasions unclear and it has some other weaknesses. Revision is needed before this manuscript can be published in ACP.

Specific comments:

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1. Page 10903, line 21, and further within the manuscript: Here it said that polycarbonate foils were used in the impactors. Later, it becomes polycarbonate filters (thus with pores). Were it foils or filters and if it were filters what was the pore size? Also, were the aluminum foils and polycarbonate foils/filters coated with a grease? If not, was there no danger of particle bounce off?
2. Page 10905, line 8: Acronyms and abbreviations (here DI) should be defined (written full-out) when first used. Presumably, DI stands for deionized.
3. Pages 10906–10908, section 3.1: The data from the current study are compared with data from a few other rural sites, but several more data sets from rural sites in Europe are available. Under References below, I list a number of publications from the past ten years, which contain aerosol trace metal data for rural sites in Europe. Why is no comparison made with those data? On which basis were the data sets and rural sites selected that were used for the comparison?
4. Pages 10913–10914, section 3.3: Although it is also stated in some other publications that “an enrichment factor above 10 is considered as a significant enrichment”, deducing from it that “enrichment factors between 0.70 and 10 are considered to be similar and within the error range of the reference source, implying that the elements with such factors might have originated from a similar source” is in my opinion not justified or at least grossly exaggerated. To my feeling, it should be “between 0.70 and 2” or at most “between 0.70 and 3” in the above statement. Also, there are no literature references given for backing up the above statement in the manuscript.
5. Page 10929, Table 2: Acronyms and abbreviations (here LEV) should be defined (written full-out) when first used. Presumably, LEV stands for levoglucosan. There is actually no need for this acronym as it not used elsewhere in the text.
6. Pages 10933–10935, Figures 2–4: The symbols and text in these figures are too small.

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7. Problems with references:

Page 10918, lines 4 and 13: "Schwanz (1998)" is not in the Reference list. There is "Schwanz et al. (1998)" in that list, to which no reference is made within the text.

Page 10922, lines 26-27: There is no reference made within the text to "Desboeufs et al. (2001)".

Page 10928, heading of Table 1: "Hueglin et al. (2011)" is not in the Reference list.

Page 10930, footnote for Ref. E: "Wrzesinsky et al. (2000)" is not in the Reference list; there is "Wrzesinsky and Klemm (2000)" in that list.

8. Technical and other minor corrections:

p. 10900, l. 3: Replace "were performed" by "was performed".

p. 10900, l. 25: Replace "mark increase" by "marked increase".

p. 10902, l. 4: Replace "have been observed" by "has been observed".

p. 10902, l. 5: Replace "have also been" by "has also been".

p. 10902, l. 22: Replace "(Tilgner et al., 2014)" by "Tilgner et al. (2014)".

p. 10903, l. 11: Replace "(Tilgner et al., 2014)" by "Tilgner et al. (2014)".

p. 10905, l. 25: Replace "influence by" by "influenced by".

p. 10906, l. 8-9: Replace "(Oktavia et al., 2008)" by "Oktavia et al. (2008)".

p. 10906, l. 23: Replace "(Rüd, 2003)" by "Rüd (2003)".

p. 10907, l. 22: Replace "and those" by "than those".

p. 10908, l. 1: Replace "(Rüd, 2003)" by "Rüd (2003)".

p. 10909, l. 2: Replace "easily loss" by "easily lost".

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p. 10910, l. 12: Replace "have been" by "has been".

p. 10910, l. 14: Replace "(Schmidl et al., 2008)" by "Schmidl et al. (2008)".

p. 10910, l. 24: Replace "metals may" by "metals that may".

p. 10910, l. 25: Replace "or are simply" by "or is simply".

p. 10913, l. 25: Replace "mostly present in the coarse mode as in" by "more present in the coarse mode than in".

p. 10915, l. 25: Replace "China, (Guo" by "China (Guo".

p. 10915, l. 26: Replace "(Wang et al., 2014)" by "Wang et al. (2014)".

p. 10915, l. 29: Replace "influence hence" by "influence, hence".

p. 10916, l. 24: Replace "Fig. 7 below" by "Fig. 7".

p. 10918, l. 21: Replace "and 2 above" by "and 2".

p. 10919, l. 4: Replace "and Cr," by "and Cr".

p. 10919, l. 16: Replace "Mn, in" by "Mn in".

p. 10919, l. 22: Replace "Cr, concentrations" by "Cr concentrations".

p. 10920, l. 26: Replace "year ago" by "years ago".

p. 10928, heading of Table 1: Replace "UK) Ref 5" by "UK), Ref 5".

References

Aldabe, J., Elustondo, D., Santamaria, C., Lasheras, E., Pandolfi, M., Alastuey, A., Querol, X., and Santamaria, J. M.: Chemical characterisation and source apportionment of PM_{2.5} and PM₁₀ at rural, urban and traffic sites in Navarra (North of Spain), Atmospheric Research, 102, 191-205, 2011.

Maenhaut, W., Raes, N., Chi, X., Cafmeyer, J., and Wang, W: Chemical composition

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and mass closure for PM_{2.5} and PM₁₀ aerosols at K-puszta, Hungary, in summer 2006. *X-Ray Spectrometry*, 37, 193-197 2008.

Maenhaut, W., Nava, S., Lucarelli, F., Wang, W., Chi, X., and Kulmala, M: Chemical composition, impact from biomass burning, and mass closure for PM_{2.5} and PM₁₀ aerosols at Hyytiälä, Finland, in summer 2007, *X-Ray Spectrometry*, 40, 168-171, 2011.

Marenco, F., Bonasoni, P., Calzolari, F., Ceriani, M., Chiari, M., Cristofanelli, P., D'Alessandro, A., Fermo, P., Lucarelli, F., Mazzei, F., Nava, S., Piazzalunga, A., Prati, P., Valli, G., and Vecchi, R.: Characterization of atmospheric aerosols at Monte Cimone, Italy, during summer 2004: Source apportionment and transport mechanisms, *Journal of Geophysical Research-Atmospheres*, 111(D24), D24202, DOI: 10.1029/2006JD007145, 2006.

Masiol, M., Squizzato, S., Ceccato, D., and Pavoni, B.: The size distribution of chemical elements of atmospheric aerosol at a semi-rural coastal site in Venice (Italy). The role of atmospheric circulation, *Chemosphere*, 119, 400-406, 2015.

Moroni, B., Castellini, S., Crocchianti, S., Piazzalunga, A., Fermo, P., Scardazza, F., and Cappelletti, D.: Ground-based measurements of long-range transported aerosol at the rural regional background site of Monte Martano (Central Italy), *Atmospheric Research*, 155, 26-36, 2015.

Rogula-Kozłowska, W., Klejnowski, K., Rogula-Kopiec, P., Osrodka, L., Krajny, E., Blaszcak, B., and Mathews, B.: Spatial and seasonal variability of the mass concentration and chemical composition of PM_{2.5} in Poland, *Air Quality Atmosphere and Health*, 7, 41-58, 2014.

Vlastelic, I., Suchorski, K., Sellegri, K., Colomb, A., Nauret, F., Bouvier, L., and Piro, J. L.: The trace metal signature of atmospheric aerosols sampled at a European regional background site (Puy de Dôme, France), *Journal of Atmospheric Chemistry*, 71, 195-

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212, 2014.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 15, 10899, 2015.

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