

Interactive comment on “Long-term measurements of aerosols and carbon monoxide at the ZOTTO tall tower to characterize polluted and pristine air in the Siberian Taiga” by X. Chi et al.

Anonymous Referee #3

Received and published: 26 August 2013

This is a fine manuscript. It describes and discusses results from long-term measurements (over 4 years) of aerosols and carbon monoxide at a site in Central Siberia. Although part of the data set was already discussed in earlier publications, there is definitely more than enough new material (both in terms of data and interpretation) in the present manuscript. The interpretation of the data is clear, thorough, and overall quite convincing. The manuscript is definitely worthy of publication in ACP. I have only minor comments.

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Specific comments:

1. Page 18,369, lines 1-2: Does the larger summer single scattering albedo at ZOTTO than at SMEAR II (0.96 versus 0.91) imply that the secondary aerosol formation during summertime is much stronger at ZOTTO than at SMEAR II? If so, is there any evidence for this? Is there no alternative explanation possible? Could it not be that there is a higher impact from biomass burning aerosols in summer at the SMEAR II site than at ZOTTO?

2. Page 18,369, line 23: The time series for CO in Fig. 1 shows data up to July 2011. In both the Abstract and the Introduction it says that this manuscript presents and discusses data up to December 2010. Were the CO data of the period December 2010 to July 2011 included when calculating medians, ranges, averages, and standard deviations for CO in this manuscript? This should be clarified.

3. Page 18,372, line 1: CH₄ is mentioned here and also on several occasions further on, but it is unclear where the CH₄ data come from or how they were obtained. There is nothing said about methane in the section “Measurements and methods”.

4. Page 18,372, lines 15-16: A literature reference is needed for the statement in this sentence.

5. Page 18,415, Fig. 12: It should be indicated what the units (and scale) are in the ordinate for the monoterpene emissions.

6. Problems with references:

p. 18,348, l. 26: “Zhang et al. (2011b)” is not in the reference list. There are two “Zhang et al. (2011)” references in that list, but it is unclear to which of the two the authors make reference here.

p. 18,360, lines 23 and 25: “Ruckstuhl et al. (2010)” is not in the reference list. There is “Ruckstuhl et al. (2012)” in that list, to which no reference is made within the text.

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p. 18,360, l. 24: “Zhang et al. (2011a)” is not in the reference list. There are two “Zhang et al. (2011)” references in that list, but it unclear to which of the two the authors make reference here.

7. Technical and other minor corrections:

p. 18,346, l. 6: Based on what is written on p. 18,352, l. 23, “90” should be replaced by “89”.

p. 18,352, l. 2: Replace “are given” by “is given”.

p. 18,353, l. 27: Replace “referred as” by “referred to as”.

p. 18,354, l. 12: Replace “0.17, 0.26” by “0.17, and 0.26”.

p. 18,358, l. 14: Replace “distributions” by “distribution”.

p. 18,361, l. 16: Replace “Anthropogenic” by “anthropogenic”.

p. 18,363, l. 11: Replace “Gunthe et al., (2009)” by “Gunthe et al. (2009)”.

p. 18,366, l. 29: Replace “inter quartile” by “interquartile”.

p. 18,368, l. 20: Replace “are somewhat” by “is somewhat”.

p. 18,369, l. 1: Replace “summer values” by “summer value”.

p. 18,369, l. 6: Replace “0.77-.89” by “0.77-0.89”.

p. 18,371, l. 1: Replace “concentrations” by “concentration”.

p. 18,371, l. 24: Replace “foot print” by “footprint”.

p. 18,377, l. 8: Replace “to other” by “to that at other”.

p. 18,377, lines 17-18: There is something wrong here, i.e., with “due to a diurnal errcycle suggests that”. The latter should likely be replaced by “due to a diurnal cycle in the local emission sources and photochemical processes. In our case, the long

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growth cycle suggests that”, like was written in the previous version of this manuscript.

p. 18,380, l. 22: Replace “because they have” by “because the VOCs have”.

p. 18,381, l. 22: Replace “Fig. 13a” by “Fig. 13”.

p. 18,384, lines 26-27: These two lines should be deleted.

p. 18,399, first line of heading of Table 1: Replace “ranges” by “range” and “deviations” by “deviation”.

p. 18,400, third line of heading of Table 2: Replace “Dec 2011” by “Dec 2010”. Or should it perhaps be “July 2011”? (See my comment 2 above).

p. 18,402, first line of heading of Table 4: Replace “Median and ranges” by either “Medians and ranges” or “Median and range”.

p. 18,406, last line of caption of Fig. 3: Replace “December 2011” by “December 2010”.

p. 18,408, second line of caption of Fig. 5: Replace “aerosols size” by “aerosol size”.

p. 18,415, second line of caption of Fig. 12: Replace “temperature solid” by “temperature; solid”.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 18345, 2013.

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