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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Long-term measurements (2010–2014) of carbonaceous aerosol and carbon monoxide at the Zotino Tall Tower Observatory (ZOTTO) in central Siberia" *by* Eugene Mikhailov et al.

Anonymous Referee #2

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This manuscript presents results from long-term measurements of PM mass, EC, OC, and WSOC concentrations in PM10 filter samples collected at the Zotino Tall Tower (ZOTTO) in Siberia over the period of 5 years (2010-2014). These measurements are also complemented with CO measurements. The manuscript is well written and data has been adequately discussed. However, there are a few shortcomings which needs to be addressed before considering this manuscript for publication.

Specific comments:

(1) Abstract is too long and shall be shortened by 30 or 40%.

(2) Page 8, line 5: how the uncertainty on PM mass determination was assessed? Include this information in the text.

(3) WSOC was measured indirectly, which can be a source of significant uncertainty. The method used here may overestimate WSOC because 12 h soaking of filter in deionized water would remove water-soluble fraction of OC, however, at the same time some insoluble OC may also come out of the filter, which will be estimated as WSOC. How the reliability of this method was tested? This information shall be included in the text.

(4) Uncertainty in WSOC measurements will also affect the WSOC/OC ratio reported in this study, which shall be discussed in the text.

(5) To convert OC into OM, a conversion factor of 1.8 has been used, which is another source of uncertainty in estimated TCA. This conversion factor is likely not uniform throughout the study period. It may vary from 1.4 to 2.2 (Turpin and Lim, AS&T, 2001). This fact shall be mentioned in the text while discussing TCA or TCA/PM data.

(6) Page 10, line 25: WSOC/OC ratios are given in %, which looks odd. Ratio should be written in fraction form e.g. 65% should be written as 0.65.

(7) At many places in the manuscript, sometime abbreviations are used and sometime the full words are used. Use abbreviations only after defining them when they appear for the first time.

(8) Fig. 3: y-axis is on log scale. Start y-axis from 1 rather than 0.1 so that EnF are prominently visible.

(9) Interpretation of Fig. 15 doesn't look very convincing as the there is no significant effect of temperature on monoterpene emissions upto 15 oC or so, whereas OC/PM ratio shows the observed trend for the temperature ranging from 0 to 15 oC.

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