Atmos. Chem. Phys. Discuss., 8, S6903–S6906, 2008
www.atmos-chem-phys-discuss.net/8/S6903/2008/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Polar organic tracers in $PM_{2.5}$ aerosols from forests in eastern China" *by* W. Wang et al.

W. Wang et al.

Received and published: 11 September 2008

We would like to thank the anonymous referee 1# for useful and constructive comments.

In response to the comments, the following changes will be made in the revised manuscript:

General comments

Additional information on the sampling will be provided, also taking into account our responses to the comments made by Dr. C. Oliveira: "All sampling periods were selected taking into account the meteorological conditions and the maximum solar radiation, as well as high temperatures. The sampling periods were 23 - 29 July 2007 for Changbai, 12 - 19 June 2006 for Chongming (only one nighttime sample was collected due

to rain), 2 - 14 August 2006 for Dinghu, and 20 - 27 November 2006 during the dry season in Hainan. In the case of Dinghu, the sampler was installed at the hilltop in the Dinghu Mountain Biosphere Reserve, which is a station of the Man and the Biosphere Programme of the United Nations Educational, Scientific and Cultural Organization, only 24-hr samples could be collected at this site for safety reasons"

Specific comments:

1. The suggestion of the referee to more clearly state the goals at the end of the introduction will be considered in the revised manuscript.

2. A possible reason why "the concentration of the alpha-pinene tracers is low in the temperate zone of Chongming" could be that the plantation area is only 3 km2, although the major tree species is coniferous water fir. As the ecosystem varies from boreal to temperate, subtropical and tropical regions, there are less and less alpha-pinene-emitting species.

According to the study of Yan et al. (page 12442 line 27, to page 12443 line 3), "the annual biogenic isoprene emission is about 4.8 Tg C in whole China, and its spatial distribution corresponds with that of the vegetation. The highest annual emission flux exceeded 5000 kg C/km2 in northeastern China, including Changbai Mountain, and Hainan Island".

3. The comment relates to section 2.2, not 3.2. In response, details about the CO2 instrument will be given (page 12440, line 23): "CO2 was measured by a commercial instrument, gas filter correlation analyzer (TEI, model 41C)."

4. Section 2.3. In response, the actual mass of the internal recovery standards added will be provided: "the samples were spiked with appropriate amounts of internal recovery standards (IS), i.e. 400 ng methyl-beta-D-xylanopyranoside (MXP, Sigma) and 750 ng deuterated D3-malic acid (DMA, CDN isotopes, Canada." It will also be mentioned that the electron ionization mode was used. A sentence "The mass spectrometer was

ACPD

8, S6903–S6906, 2008

operated in the electron ionization mode at 70 eV and the scanned mass range was m/z 50 - 650." will be inserted before "Individual compounds were identified by comparison of mass spectra with those of authentic standards or literature data (Claeys et al., 2004a; Wang et al., 2004, 2005; Claeys et al., 2007)."

5. The referee suggests showing a total ion chromatogram to get a sense for the quality of the chromatography. In response, a total ion chromatogram will be provided in the revised manuscript.

6. Page 12443, line 25. We agree with the interpretation of the referee that a high correlation coefficient in this case means that the parameters are correlated and not necessarily that there is a direct impact.

7. Page 12444, line 9. In response, the references cited earlier will be moved to line 9: (Surratt et al., 2007a, 2007b; Gomez-Gonzalez et al., 2008).

8. Section 3.2. Yes, indeed for the Chongming site we observe extensive primary emissions due to biomass burning, which is reflected by the very high concentrations of the tracers, levoglucosan and mannosan. The high OC levels measured in Chongming are thus likely due to biomass burning; this will be discussed in the revised manuscript.

9. The referee makes the important point that the isoprene and alpha-pinene tracers themselves only represent a small fraction of the OC mass. This issue will be appropriately addressed in the revised manuscript; more specifically, using the measured SOA tracer concentrations and laboratory-derived tracer mass fractions reported by Kleindienst et al. (Atmos. Environ. 41, 8288-8300, 2007), the average SOA attributable to isoprene and alpha-pinene will be estimated.

10. The scale on the CO2 plot in Figure 2 will be corrected to ppmv. We inquired and found that there were a few small power plants nearby, the higher than background CO2 level was probably due to local emissions.

Technical comments:

ACPD

8, S6903–S6906, 2008

Interactive Comment

In response, we will mention that the ratio of 1:3 is lower than 1:13.

In Figure 1, Jianfengling will be changed to Hainan.

According to the Merriam-Webster Online Dictionary, the term "diel" means "involving a 24-h period that usually includes a day and the adjoining night". The term "diurnal" is less specific and has more meanings. The term "discrepancies" will be replaced with "differences" (p.12442, L23).

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 12435, 2008.