Atmos. Chem. Phys. Discuss., 13, C5521–C5523, 2013
www.atmos-chem-phys-discuss.net/13/C5521/2013/

Atmospheric Chemistry and Physics Discussions

ACPD
13, C5521–C5523, 2013

Interactive Comment

Interactive comment on "Seasonal variation of black carbon over the South China Sea and in various continental locations in South China" *by* D. Wu et al.

Anonymous Referee #1

Received and published: 5 August 2013

Comments on "Seasonal variation of black carbon over the South China Sea and in various continental locations in South China" by Wu et al.

The manuscript by Wu et al. investigated the seasonal variations, spatial variations, and diurnal variations of BC at five continental sites in PRD region and a rural site over the South China Sea. While the BC concentrations at urban sites n PRD region were generally higher than those observed at other locations outside China, they were comparable at the rural sites. Pronounced seasonal variations of BC with higher concentration in the dry season were also observed at urban sites, yet not at the oceanic site. Because BC is an aerosol component playing important roles in Earth's climate

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

system, the data of this study is scientifically important to the community of atmospheric science, and the results help us understand the BC behaviors in PRD region - a highly polluted area in China. The manuscript is overall well written, but some conclusions appear to be misinterpreted, which needs to be addressed before publication.

Major comments:

1. The authors claimed that the BC showed bi-peak diurnal patterns at all sites, and such patterns were most prominent at the urban sites. When I looked at the Fig. 5, I didn't see such bi-peak patterns except at the site of YX. In fact, the BC at most sites just showed pronounced diurnal cycles with higher concentrations at night although small morning peaks were also observed at some sites.

2. Another conclusion the authors concluded is that BC was a regional pollutant based on the inter-site correlation analysis (pp 17390, line 15-16). It's well known that BC is mainly emitted from local sources (except the biomass burning events), e.g. diesel trucks at urban sites. The conclusion in this study appears to be inconsistent with the previous one because the inter-site correlation analysis might be biased by the consistent BC variations among different sites, i.e. high concentration at night and morning rush hours. Table 1 also showed that the BC among different urban sites was not consistently tightly correlated, for example, the pearson's r was 0.49 between NC and PY in dry season, which was much lower that (>0.70) between NC and DG/XK. If the BC is a regional pollutant, I would expect similar correlations among different sites.

Specific comments:

1. P 17376, line 14: check the numbers, not consistent with those in the conclusions.

2. P17380, line 10: typo "is en route"

3. P17384, line 5-6: The authors claimed that wet deposition was not a major cause of low BC in the rainy season, however in line 10-11, the authors listed it as a stronger removal of BC.

ACPD
13, C5521–C5523, 2013

4. P17384, line 27: typo “NC and MFC”

5. P7388, line 3-4: Again, I cannot see “The bi-mode peak pattern was more prominent in the rainy season” in the Fig. 5. In fact, in Fig.5, such bi-mode peak is more significant in the dry season. Also I would argue the bi-mode peaks of BC diurnal variations in this study.

6. Fig. 3, please give the time that the trajectories were calculated.

7. Fig. 5, explain the error bars, standard deviations or standard errors?

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 17375, 2013.