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Atmospheric Chemistry and Physics Discussions

Interactive comment on " Summer and winter variations of dicarboxylic acids, fatty acids and benzoic acid in $PM_{2.5}$ in Pearl Delta River Region, China" *by* K. F. Ho et al.

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Specific comments:

The number of collected samples from each site and season is relatively low. As a result, there may be problems with the statistical significance of the correlation analysis presented in section 3.4. The authors should evaluate the statistical significance of the obtained results (correlations) and document it in section 3.4.

Response: The statistical significance of the correlation analysis has been evaluated

and presented in Table 2 and section 3.5 in revised manuscript.

The summer to winter differences in concentrations of various organic compounds seems to be affected by both photochemistry and air mass transport patterns (especially the location of each site with respect to major source areas). There are a few issues that should be clarified a bit here. First, how typical the observed air mass transport patters are for this region? Are air flows in summer and winter always like those presented in Figure 2, or was this major difference between the two seasons just a coincidence?

Response: Meteorological conditions over this region and a large part of Asia are strongly influenced by Asian monsoon circulations. During the winter, prevailing surface winds are northerly and northeasterly. By contrast, southerly and southwesterly winds are predominant in the summer. Such meteorological conditions make the coastal region of southern China an ideal place to measure the chemical composition of polluted continental outflow in the winter and clean South China Sea air during summer (Guo et al., 2010). It is similar to the air flows presented in Figure 2.

Reference Guo, H., Simpson, I. J., Ding, A. J., Wang, T., Saunders, S. M., Wang, T. J., Cheng, H. R., Barletta, B., Meinardi, S., Blake, D. R., Rowland, F. S., 2010. Carbonyl sulfide, dimethyl sulfide and carbon disulfide in the Pearl River Delta of southern China: Impact of anthropogenic and biogenic sources. Atmospheric Environment 44, 3805-3813.

Second, the summer to winter ratio in the concentrations of the individual compounds seem to be affected by mainly by the location of the site, whereas their abundances in OC (percent contribution) seem to be affected largely by photochemistry. This is brought up in the abstract but not so well in summary and conclusions.

Response: Summary and conclusions have been revised as suggested by reviewer.

Third, for these reasons mentioned above, I am not sure whether one should average

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TQWOC over all the sites when comparing summer and winter concentrations to each other (abstract and beginning of section 3.3).

Response: We truly understand the points from the reviewer. The term of TQWOC is defined as the sum of diacids, ketoacids and α-dicarbonyls. Therefore, with the same explanation for various organic compounds shown in the second response, average TQWOC over all the sites were compared in section 3.4.

Page 26686, line 18: indicate that

Response: Revised as suggested

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 26677, 2010.