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Atmospheric Chemistry and Physics Discussions

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.

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Reviewer II

Review of "Seasonal variation of black carbon over the South China Sea and in various continental locations in South China" by Wu et al. The paper exams the measured black carbon concentrations in southern China, including a measurement site in southern China Sea. The results are valuable to study the black carbon concentrations in both the background (in the ocean site) and polluted areas (urban sites) to get insights the magnitude of the urban emissions on the regional black carbon concentrations. The

paper is well written, and the methods are reasonable. However, the figures need to replotted, and more detailed analysis of results should be conducted. I think this paper can be published after address the following comments.

Response: We thank the reviewer for his/her overall positive comments. Our point-by-point response to the review comments is listed below. The revised manuscript that has incorporated response to reviewer comments is submitted together with this response. Line numbers cited in our response refer to line numbers of the revised manuscript. Please see below for point-by-point response to comments.

Comments; (1) The figures need to be re-plotted. For example, in Fig. 1, the lower panel shows the location of the measurement, which is very important information. However, the words are too small, which cannot read by readers. I suggest to add an individual table.

Response: We feel it is better to keep the text information about the sampling locations together with the map so that readers can get the essential information in one place. The problem of small word size is partially related to the type-setting of ACPD, as its page size in the print version is just half of A4 size, making both figures and text too small on the printout. We believe this is less a problem if published on ACP. Nevertheless, we have enlarged the text below Figure 1 in the revised manuscript to improve readability.

(2) All the information in Fig.2 is impossible to read, and should extensively revised.

Response: Again we feel the problem is related to the type-setting of ACPD. We now include a version of this figure in bigger size as part of the supplementary materials (Figure S8).

(3) There are large differences of the BC concentrations during the rainy and dry seasons, which is a major portion of the paper. I suggest the Authors should address this issue with more detailed analysis. For example, for the effect of the wind direction, the

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Authors should give some information regarding the upward emissions to analyze the individual contributions for the measured BC due to transport of pollutants, precipitation, and other factors.

Response: (1) We have added more detailed analysis in section 3.3 to describe the impact of rainfall and wind on BC levels between the two different seasonal sampling periods. (2) We also add a paragraph (Lines 229-236) to describe how variation in mixing height was linked with episodic events recorded during the sampling periods.

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