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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Investigating size-segregated sources of elemental composition of particulate matter in the South China Sea during the 2011 Vasco Cruise" *by* Miguel Ricardo A. Hilario et al.

Anonymous Referee #2

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Review of Hilario et al. paper entitled "Investigating size-segregated sources of elemental composition of particulate matter in the South China Sea during the 2011 Vasco Cruise" submitted to Atmos. Chem. Phys.

The paper summarizes an aerosol source apportionment in the South China Sea during a relatively short ship cruise. The results provide additional evidence on various sources and their variability in the region. The results are interesting and self-consistent although not very novel. Overall, I suggest the paper to be accepted in ACP after considering my comments and suggestions below.

Major comment:

1) Mass concentration: What are the typical mass size distributions for the total mass? This would be helpful to show at the beginning. 2) Why is there such a drastic difference between stages 5,6 and 7? Is this a sampling artefact or real? Is there mass on the stage 6, which seems to be drastically lower in many of the mass distribution of specific elementals (Figure 2).

Minor / technical comments:

L 17-18: On what grounds the area has the most complex aerosol-meteorological system?

L 32-34: The source analysis of aerosol mass and tracers is very far from understanding the regional aerosol-cloud interactions.

L 72, L107, L 225: boreal summer monsoon? Northern hemisphere summer? The term boreal is very specific in my field connecting to a specific vegetation type, which I think is very far from the environment pertinent to this paper.

L 73: Although MC is defined earlier, the message would be much clearer, if the name of the area would be spelled out.

L 76: Please include year for the date of the typhoon as well.

L 128: Figure 2: AGL and UTC/LST not defined in the text.

L 150: Driving meteorology from a model or reanalysis? Please specify.

L 160: MODIS is spelled out here for the first time.

L 187: Does the modes here refer to size distribution or to source specific modes? Please clarify. How much do you lose data due to filtering? This could also be an indication of some problems with sampling.

L 226: a.g.l. was earlier AGL. Please be consistent.

L 267-L289: A good discussion. Why is the concentration on stage 6 so much lower than on the steges 5 and 7?

L 315-316: Please correct the sentence: During this period, plume concentration dropped sharply before recovering due to the passage of squall lines sharp, . . . L 318: What do you mean by aerosol-convection interactions? How do you connect elementary composition to these interactions?

L 337: Section 4 is well written and informative.

L 380: Figure 7: I would show the mass concentrations in units ug m-3. How does these numbers correspond to the integrated mass concentrations from the filters (total mass)?

L 411: Please summarize the results of the regression results at the end of the section. In the current form it is difficult to see the importance of the findings (Sulfur and connection to biomass burning, V/Ni ratio in connection with oil combustion and discussion on Si-enhancement). Maybe a reorganization with Sect 5 would help to convey the message? In the current form, Sect 5 is very short and it could be integrated with the earlier section.

L 430: Supplementary material.

L 444: What do you mean by “timestamp”? A specific concentration at a given time?

L502: See my comment on the stage 6. Is it feasible to have such a drastic difference between three adjacent size ranges (stages 5,6,7)?

L 511: . . . evidence of high levels of MC burning? Please clarify.

L 514: Please remind the reader that TC is a tropical cyclone.

L 528: three size modes

L 571: Rapid nucleation event is brought up only in the conclusions. Also secondary

formation during transport is brought up at the end. Please clarify. Is there data to support this?

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