

Interactive comment on “Dynamics of phytoplankton community structure in the South China Sea in response to the East Asian aerosol input” by C. Guo et al.

Anonymous Referee #4

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This is a valuable study on the in situ changes of phytoplankton community structures in response to aerosol loadings over the South China Sea. Authors conducted a series of microcosm bioassays at different geographical locations and with additions of various amounts of aerosols. Several parameters were carefully measured showing both positive and negative responses and detailed community dynamics of the phytoplankton in the microcosm experiments. I have few comments:

- It seems only one PM_{2.5} sample in 8 by 10-inch Quartz filter was used for the whole incubation experiments, which was collected in one sunny day of the December 2010 as the northeast monsoon prevailed. There is little information about the chemical

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composition of the aerosol sample used as well as the typical winter aerosols over the South China Sea. I wonder if the filter sample is selected particularly out of a series of filters sampled continuously in HKUST, and how representative it is in terms of the aerosols in certain period over the South China Sea? It is important to know at least the percentage of PM_{2.5} in total suspended particles (TSP) over this region since only PM_{2.5} was used in the microcosm experiments which may significantly bias the results as the coarse particles (>2.5 micrometer) is a major contributor to the dry deposition fluxes of chemical components to the ocean surface.

- The aerosol filter was dissolved in prefiltered seawater followed by 0.2 micrometer filtration to make the aerosol leachate before the cruise. How was the leachate stored during the cruise, and for how many hours before it was used in the microcosm experiments? I would suggest to use sub-sampled aerosol filters directly in the incubation instead of aerosol leachate, because biological uptake of nutrients or trace elements from aerosol particles could be a rapid and dynamic process and the existence of microorganisms in seawater may enhance the dissolution of some refractory trace elements (e.g. Fe) from the aerosol. Concentrations of nutrients and trace elements should be determined at time zero and then along with each sampling time point.

- Page 6652 line 12, “. . .supporting the point that N was relatively limited in this ecosystem.” I think that N/P ratios larger than 16 should indicate a P limitation in this oceanic region.

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