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Interactive comment on "Lytic viral infection of bacterioplankton in deep waters of the western Pacific Ocean" *by* Y. Li et al.

Anonymous Referee #1

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Review of manuscript " Lytic viral infection of bacterioplankton in deep waters of the western Pacific Ocean" by Y.Li et., al.

The authors investigate the possible effect of the viral-host interactions on the biogeochemical cycles throughout the entire water column in two different transects located in the western Pacific Ocean. The authors found significant correlations between viral abundance, production and prokaryotes, suggesting an important role of deep-sea viruses on the carbon cycling at local and global scales. However the viral parameters (abundance and production) did not correlate with the other variables at specific depth layers, in partial disagreement with the previous results.

Major comments

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The viral production rates are mainly dependent on the presence of a suitable host. While the host abundance (in this case prokaryotes and pico-phytoplankton in surface) depends on multiple factors such as inorganic nutrient, DOM, physico-chemical characteristics. I strongly suggest that the authors improve the statistical analysis to support their conclusions on which are the main factors controlling the viral abundance and production in these two transects. A simple correlation analysis is not sufficient to explain the complex relationship between prokaryotes and viruses throughout water column; multiple factors need to be taken in account simultaneously. Thus, I strongly suggest the authors to implement the statistics with any kind of multivariate analysis (multiple regression analysis, DISTML test, Path analysis). Any of these approaches can help you to identify the best set of variables explaining the variation of the viral and bacterial parameters in your system. Hence, the authors should refocus the manuscript stressing the main findings obtained after conducting the multivariate analysis.

Minor comments

Page 3, Line 15-20. Please rephrase the sentence.

Page 3, Line 20-23. This sentence can be deleted from the manuscript

Page 7, Line 6. PSU is not an international scientific unit and its use is not recommended, salinity does not have units.

Page 7, Line 26. Please change “bathypelagic sea”.

Page 8, Line 12-16. The authors mention some correlations between viruses and inorganic nutrients. As stated above, viral abundance and production are mainly dependent on the availability of a suitable host, thus inorganic nutrients do not have a direct influence on the viral parameters. Which would be the mechanism for this relationship? How nutrients will affect viruses?

Page 9, Line 17-21. Please see the previous comment.

Page 13, Line1-25. The sentence needs to be rephrased accordingly to the multivariate

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analysis results.

Page 14, Line 27-29. The paragraph has to be revised in a more concise way.

Page 15-16. Please refocus the conclusion accordingly to the multivariate analysis results.

Figure 3 could be moved to the supplementary information; additionally you could present a new figure showing the bacterial and viral parameters versus depth.

Please invert the x-axis on figure 2 (second transect) from 3°N ->18 °N to 18 °N -> 3°N.

The manuscript would also benefit from the revision of the English usage.

Interactive comment on Biogeosciences Discuss., 10, 19633, 2013.