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Interactive comment on "Methyl iodide production in the open ocean" *by* I. Stemmler et al.

Anonymous Referee #2

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This paper describes the results of model simulations that are supposed to tell us about the factors controlling the production of CH3I in the global surface ocean. The authors are using a model they developed previously to assess the controls on the production of CH3I in the water column. They link that model to a global ocean circulation model to extrapolate to global ocean and then compare to a newly released dataset of CH3I in the surface water from a number of cruises around the globe. The idea is good, but I am not sure that we know enough to accomplish it.

I am not sure these results actually move our understanding of the cycling of CH3I in the surface ocean forward beyond what was determined in the earlier paper describing the water column model. Also, there is far too much reliance on what was in the earlier paper. While I understand this is meant to be a continuation of that work, this paper cannot be read on its own in its current form. I have some concerns that the results from the earlier paper are not strong enough to support the global extrapolation described

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here.

Specifically, how is Opt 3 different from Opt 1 except in the scaling factors? The SLDOC is linked to PP, and PAR would promote PP in regions with enough nutrients leading to higher SLDOC. To me, this is still about PP. Also, don't you need UV, not PAR, to react with the SLDOC to produce CH3I? What is the chemical mechanism proposed here?

There are also some language issues that make the paper difficult to follow. I feel that major revision is necessary to allow publication of this paper.

I am including only a few other specific issues below (in no particular order):

1) I find eyeballing maps of calculated CH3I distributions and comparing them to a cruise track difficult. How do the results compare on a point by point basis? Correlation plots would help here.

2) Figure 4. It looks like RDOC produces more CH3I than SLDOC. This doesn't make sense. Refractive DOC should be less reactive.

3) Figures in general – use the same color code for the opt's in all figures. It is confusing in Figures 8, 9 and 10.

4) The statistics describing the comparison of model to observations is lacking.

5) As someone who has made measurements and used models, I don't fault data for lack of agreement to a model. I fault the model and an incomplete understanding of the processes being modeled.

Interactive comment on Biogeosciences Discuss., 10, 17549, 2013.