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Biogeosciences Discussions

Interactive comment on "Testing the relationship between the solar radiation dose and surface DMS concentrations using high resolution in situ data" *by* C. J. Miles et al.

Anonymous Referee #3

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Authors compare previously published observations of DMS made on 3 Atlantic Meridional Transect cruises with the solar radiation dose (SRD) for the mixed layer. This work follows very closely previous work done by the same authors (Bell et al. 2006; DSR2) testing then existing models of DMS with the AMT data set. The hope is to test relationship between mixed layer DMS and solar radiation, most notably UV radiation, previously discussed by Toole and Siegel (2004) and Vallina and Simo (2007). The authors show good correspondence between SRD estimates nearly however it is calculated (climatological MLD, in situ MLD, fixed k, UV with no clouds, etc.).

The problem is that is all the new insights the paper provides. I guess it provides more

evidence that DMS is related to solar radiation dose; but I really wish that the analysis presented was deeper and more insightful. The comparison between the different and incorrect formulations of the SRD is not useful. The SRD is a function of the MLD, incident light (Io over some spectral band) and light attenuation coefficient (k for the same spectral band). This whole exercise seems a bit silly without altering the light attenuation coefficient in response to known variations in chlorophyll and colored DOM distributions which alter light attenuation. Variations in k are as big as MLD in this game. These data may not be available from the AMT cruises but there is a decade of satellite ocean color observations from which this could be done. These data are readily available through many sources. Further, daily UV radiation rates at the sea surface are available from NASA. So, I believe that the full problem could be done correctly.

It is my opinion that this work is not suitable for publication in Biogeosciences at this time. As it stands, there is not enough new work to warrant publication in a high impact journal. There is more work that needs to be done to achieve this and all data are available to do it. Once the SRD is correctly formulated, the interesting problem would be to see where this relationship does not hold and why (plankton functional type, nutrient / mixing regime, etc.). That kind of analysis could provide new insights into how DMS varies in the ocean. The present manuscript does not.

Interactive comment on Biogeosciences Discuss., 6, 3063, 2009.