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Biogeosciences Discussions

Interactive comment on "Evidence for aggregation and export of cyanobacteria and nano-eukaryotes from the Sargasso Sea euphotic zone" *by* M. W. Lomas and S. B. Moran

Anonymous Referee #3

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In this paper, Lomas and Moran investigate with observations the interesting question of whether nanoplankton significantly contribute to carbon export, as was recently suggested on the basis of modeling results in a recent paper by Richardson and Jackson. Pinning down this contribution quantitatively would help refine flux budgets, especially in oligotrophic areas where the effect could be larger.

They address the question by analyzing pigments unique to nanoplankton in samples from depth profiles collected by bottles, pumps and traps. A real problem was that the pumps did not collect the 1-10 micron particle fraction, which would contain the largest mass of particles. This significantly compromises the usefulness of the pump

data, as many assumptions had to be made instead. The trap samples may also be compromised as they were filled to the top with brine, which causes a false bottom so that the trap can undertrap. I am not sure why after all these years, this practice continues at the BATS site.

p. 7182 It is quite interesting that the bottle and pump pigment composition is similar in spite of the mismatch in particle size, as it does suggest homogeneity of the particles.

p. 7183 I didn't see what Fig. 6 had to do with ballasting. Perhaps that could be explained more clearly.

Why was there so much surprise that there is a positive correlation between Synechococcus and pic-eurkaryotes abundance and POC export as attributed to Brew et al (2009)? Isn't there such a relation for almost all the plankton classes due to similar seasonal patterns.

p. 7184 Why do the authors think that fecal pellets and material are always larger than 53 microns? Many types of pellets, especially those without a peritrophic membrane, break up easily into much smaller sized particles.

p. 7185 Is chlorophyllide inherently less stable than chlorophyll? That would explain the faster loss with depth.

p. 7186 This estimate is pretty shaky, but I don't mind. These are the first observational data I have seen being used to address the nanoplankton flux contribution question.

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