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Interactive comment on “Optical backscattering properties of the “clearest” natural waters” by M. S. Twardowski et al.

Anonymous Referee #1

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Overall this paper is a very good discussion of the backscattering in the clear waters experienced during the BIOSOPE cruise. Accurately measuring IOPs in these very clear waters exposes a lot of the low end problems with the measurements, and adds confidence to our measurements when we work in more normal environments (until coastal regimes when all bets are off again).

I only have a few technical questions or comments.

On page 2458, in the discussion of the calibration with beads: I would be less concerned with errors in calculations than with clumping of the beads (forming doublets and other multiplets) during measurement. My experience measuring the VSF of bead solutions tends towards seeing these effects. Any comment on how this might affect

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your calibration?

On page 2466, at bottom, it is stated that additional depth bin averaging might help improve uncertainties, but it looks visually like the average at 650 nm would still be negative, so that seems unlikely.

page 2468, it is stated that the bbp (532) and bbp(650) are completely independent measurements, but aren't these made with the same instruments that went through the same calibration process? Doesn't seem very independent to me.

bottom of this page: I would add ~30% increase for saltwater relative to pure water;

page 2469. invoking coccoliths to explain a lack of bbp(462) seems somewhat of a stretch. The Voss et al. measurements of E. Hux platelets had bb* for liths only falling off as λ^{-1} . It looks like relatively the same enhancement (about $1E^{-4}$) above the background in 530 and 650. When I look at the graphs in Fig 7, it seems like there is a hint of this same level of increase at 462, it is just masked by more noise, due to the higher molecular backscattering at this wavelength.

page 2470, bottom. On energy considerations, do you really think the 532 and 650 nm LED's would produce enough light to cause fluorescence that you could discriminate from molecular backscattering? Doesn't seem likely to me.

Interactive comment on Biogeosciences Discuss., 4, 2441, 2007.

BGD

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