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Biogeosciences Discussions

Interactive comment on "Detailed validation of the bidirectional effect in various Case 1waters for application to Ocean Color imagery" *by* K. J. Voss et al.

Anonymous Referee #2

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NOTE to readers: the BGD software turns my quotes and apostrophies into control codes. I'm not going to try to figure that out. ————————-

This paper uses measured upwelling radiances to validate a previously published, numerically derived model for the bidirectional dependence of Q factors in Case 1 water. As such it is worthy of publication. My only criticisms are on technical details of wording and units.

Page 2070, line 1: 8220;The radiance 8230;and this variation is called8230;the bidirectional effect, or BRDF of the water.8221; Calling the variation in the radiance 8220;the bidirectional effect8221; is fine. However, this variation is NOT the 8220;BRDF of

the water.8221; The BRDF is obtained from the upwelling radiance normalized by the downwelling plane irradiance and has units of 1/sr, not units of radiance.

Page 2070, line 6: 8220;The current model8230;8221; Without the Morel at al. (2002) paper in front of me, I don8217;t know if this model is a model for the BRDF, the upwelling radiance, the Q factors, or something else. Need to clarify.

Page 2070, line 10: 8220;8230;the RMS difference 8230;was on the order of 0.02-0.03.8221; Since I don8217;t know what 8220;the model8221; is a model of, I don8217;t know what the 0.02-0.03 refers to; radiance with units of microW/(cm$^2 srnm) or Q with units of sr, or perhaps something else.$

This is the first of many cases in the paper where numbers are given without units and without clear indication of even what quantity is being referred to (radiance, Q, or something else). In all cases in the paper (in the text and in Table 1 and in some figures) when a number is cited for sigma or RMS, the units need to be specified.

Page 2073, line 13: 8220;Van Heukelen8221; vs 8220;Van Heukelem8221; on page 2081, line 5

Page 2076, line 21: 8220;The two members of Eq. (4) are plotted8230;8221; Are the two members the radiances or the Q8217;s, both of which occur in Eq. (4)? Not knowing which is being plotted means that I don8217;t know the units of the cited numbers.

Figure 1 is a plot of zenith angle vs Chl 8220;for one wavelength (486 nm)8221;. Since the NuRADS instrument makes measurements for all wavelengths within 2 minutes, during which time the change in sun position or Chl is negligible, I don8217;t see that the figure has anything to do with wavelength.

Table 1. The units are presumably sr, but this should be stated.

Figure 5. The units are presumably of microW/(cm$^2 srnm), but this should be stated.$

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4, S1090–S1092, 2007

Interactive Comment

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Figure 6. It seems that the ordinate axis should be 8220;number of occurances8221; rather than 8220;frequency of occurance8221; since it does not appear that the numbers have been divided by the total number to get a frequency. Also, the 8220;(in 0.002 bins)8221; is confusing because it is the abscissa values that are binned by 0.002, not the ordinate. As before, show the units of sigma in this figure.

Figures 8 and 9: Are the units for the ordinate axis percent or something else? Are these figures comparing the model and data for Q?

Interactive comment on Biogeosciences Discuss., 4, 2069, 2007.