

Interactive comment on “Apparent optical properties of the Canadian Beaufort Sea – Part 1: Observational overview and water column relationships” by D. Antoine et al.

Anonymous Referee #1

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This paper presents measurements of apparent optical properties measured in the Beaufort Sea as part of the MALINA cruise. The measurements are then used to examine the appropriateness of using existing chlorophyll-a and productivity algorithms in this region. With the retreat of sea ice the use of remote sensing to examine ocean productivity is expected to increase. While this approach still misses the productivity associated with the ice environment the open water productivity discussed in the paper will become more important. Analysis of optical properties in the Arctic will be important to understanding the applicability of existing algorithms on this newly opening portion of the world's ocean.

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Specific comments Page 4028 Line 10 The work of Victoria Hill should also be included in the historical observations. There is reference to her work on page 4044, but no reference is provided. It seems like Marlon Lewis also worked in the region, but I don't remember the publications.

Page 4028 Line 21 Rrs does not “determine” the light backscattered, it is a “measure of” the light backscattered.

Page 4029 Line 20 What is the distance to ice, or a description of the ice field. The presence of ice will violate the underlying principal that these measurements depend on. That is a horizontally homogeneous light field. This is part of the reason that more AOP measurements have not been reported in the past. From what I see in figure 4 the presence of ice may be contaminating the measurements and discussion of the ice edge stations should probably be removed from the paper.

Page 4031 Line 21. What is the variable X described in this equation? I did not find reference to it earlier in the paper, although there is another symbol similar to X used. Page 4032 Line 24 The description of solar zenith angle should be moved up to the area with the description of other field conditions. (Page 4029)

Figure 3 Please explain the peak at 390 seen in panels C and D.

Page 4038 Again I think the ice edge stations should be removed from the discussion unless it can be demonstrated that ice did not violate the assumption inherent to the calculations. There is good reason to suspect that ice edge productivity will create different optical properties, but we need to know the measurements are good as well.

Page 4040 In discussion of K_d in Figure 6 it is important to add the depth interval that used in the calculations.

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