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Comment

Interactive comment on “Yellow substance and the shades of blue in the Mediterranean Sea” by A. Morel and B. Gentili

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Received and published: 28 August 2009

Dear Sirs,

I read this paper with great interest. The paper is well written, clear and concise. I have a few comments which may be of relevance to the authors and support their story/conclusions.

1. Discussion – Page 8518; Lines 25-27 Data on ay from the Mediterranean and neighbouring Atlantic are indeed scarce, but not entirely absent. A recent paper in BG (Kitidis, V. et al., 2006. Photochemical production of ammonium in the oligotrophic Cyprus Gyre (Eastern Mediterranean). *Biogeosciences* 3: 439-449.) reported that the average ay at 300 nm in surface waters (<20 m) of the oligotrophic Cyprus Gyre in

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May 2002 was 0.25 m⁻¹. Based on an average spectral slope of 0.024 nm⁻¹ (Kitidis, unpublished, but from the same samples discussed in the BG paper) the a_y at 443 nm would be 0.008 m⁻¹. This value is similar, albeit only half of Morel and Gentili's estimate of 0.015 m⁻¹ for the summer months of 2006. The Cyprus Gyre is particularly "blue" within the "blue" Eastern Mediterranean basin, so this may in fact explain why the measured values are lower than Morel and Gentili's estimate for the entire basin. A few papers have reported a_y data from the Mediterranean and neighbouring Atlantic. For example: a) Babin, M. et al., 2003. Variations in the light absorption coefficients of phytoplankton, nonalgal particles, and dissolved organic matter in coastal waters around Europe. *Journal of Geophysical Research-Oceans*, 108(C7): art. no.-3211. b) Ferrari, G., 2000. The relationship between chromophoric dissolved organic matter and dissolved organic carbon in the European Atlantic coastal area and in the West Mediterranean Sea (Gulf of Lions). *Marine Chemistry*, 70: 339-357. c) Kitidis, V. et al., 2006. Variability of Chromophoric Organic Matter in surface waters of the Atlantic Ocean. *Deep Sea Research II*, 53: 1666-1684.). A quick calculation of a_y 443 from a_y 300 and spectral slope for the North Atlantic Subtropical Gyre East province (NASE, 39–27 °N; Kitidis et al., 2006, *Deep Sea Research II*, 53: 1666-1684.) shows that a_y in the neighbouring Atlantic is indeed lower than a_y in the Eastern Mediterranean supporting the authors' thesis of high a_y in the Med compared to other oligotrophic waters.

2. Discussion – Page 8521; Lines 11-13 There is actually published biogeochemical information supporting Morel and Gentili's conclusions/explanation of the strong seasonality of the a_y signal and role of photobleaching in this seasonality both in the Eastern Mediterranean and neighbouring Atlantic (Kitidis, V. et al., 2006. Variability of Chromophoric Organic Matter in surface waters of the Atlantic Ocean. *Deep Sea Research II*, 53: 1666-1684.; Kitidis, V. et al., 2006. Photochemical production of ammonium in the oligotrophic Cyprus Gyre (Eastern Mediterranean). *Biogeosciences* 3: 439-449.). In the case of the Eastern Mediterranean, the C-specific absorbance of a_y is significantly lower in the surface than at depth and we showed evidence of photo-

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bleaching. In the Atlantic, We showed a significant decrease in ay between successive cruises in Spring and Autumn which may be due to photobleaching of CDM.

Interactive comment on Biogeosciences Discuss., 6, 8503, 2009.

BGD

6, C1694–C1696, 2009

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