

Interactive comment on “Fluorescence and absorption properties of chromophoric dissolved organic matter (CDOM) in coastal surface waters of the Northwestern Mediterranean Sea (Bay of Marseilles, France)” by J. Para et al.

Anonymous Referee #3

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I generally found this manuscript to be a good times series evaluation of CDOM properties in a weakly riverine-dominated coastal zone where biological production is a dominant source of CDOM. Specifically, this manuscript demonstrated, though it was only briefly discussed, the dissimilar trends in CDOM absorption and fluorescence that could lead to separate interpretations of CDOM cycling. Really, the limitation of absorption measurements, due to their much lower sensitivity than fluorescence measurements.

I like reading about this system (the authors reference other work in the region) be-

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cause of its strong autochthonous forcing despite a riverine input. This ms is building on a body of literature regarding the importance of phytoplankton and bacteria in generating and transforming CDOM. I also liked the spectral analysis of the T peak in comparison to Tryptophan.

I list below several questions and comments where clarification or correction will improve this manuscript. (p/l = page/line number)

p5684/l12: We're any other standards ran to calibrate the TOC analyzer? Or was a 1 point calibration to the DAW done? Interesting about the LCW: I also find it much higher than my MilliQ!

p5687/l9: I wonder how your CDOM absorbance results might change if you focused on lower wavelengths. For example, a₃₀₀ or a₂₈₀, which give a stronger signal than longer wavelengths. Did you do this analysis?

p5688/l: Three points here: 1) the slope ratio method of Helms would be good to investigate in this environmental setting. Does this value (S_R) change between your 2 m and 5 m depths consistently with BIX or with photobleaching? 2) Your mixing analysis is interesting, but your interpretation is potentially flawed. For example, a statistical evaluation of the outliers above and below the mixing line (i.e., adding or removing CDOM) (just a model error estimate will do) would strengthen the argument. Also, was a linear fit to the data modeled (linear regression), or did you calculate a mixing line between end-members? It appears that you performed a linear regression fit and used that model as the mixing model. That method should produce some error estimate on slope and intercept. 3) A mixing model of the S values (following Stedmon's work; see 2003 paper in Estuarine Coastal and Shelf Sci) would also be insightful here.

p5690: the discussion on CDOM flu vs CDOM abs is interesting, but doesn't this just prove the greater sensitivity of fluorescence vs absorbance? This is what I got from the data: in low CDOM environments, flu will elucidate changes and processes that abs will not, simply because of the greater sensitivity. The argument made by the data (and

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partly by the text) is that the system is truly non-conservative even if CDOM absorption coefficients and TOC exhibit conservative behaviour. p5690/l3: change 'homologue' to a more appropriate word

p5690/l18: 'the purest material'; I don't understand what this means. Please clarify your usage of this phrase.

p5691/l10: Is the Rhone River CDOM conservative or highly photodegraded in this system?

p5692: 20-25: Do you have any evidence that C peak may be at all autochthonous? Is it a feature that can migrate into the EEM with biodegradation of phytoplankton DOM (re: Coble 1998; Parlanti et al 2000)?

p5693/l16: Should this really be that surprising? Isn't the Rhone River a very small influence here? The Arles station data show that the Rhone is low in TOC and CDOM (compared to other rivers).

p5696/l5: I think that most tryptophan isn't found as free protein, but rather as residue or bound to something else. That might also complicate your interpretation and your spectral analysis.

p5696/l28: Please clarify 'CDOM exhibited...spectral slope (Table 2)'; I don't understand this at all.

Interactive comment on Biogeosciences Discuss., 7, 5675, 2010.