All the suggestions and corrections of the Reviewer are now included in the revised manuscript (MS). As suggested by Reviewer, we added supplementary data, more particularly CDOM data related to the Rhône River and the photo irradiation experiment. We found that most of the Reviewer's comments were helpful and contribute to improve the quality of the paper.

General comments

1. *I have concerns regarding the presentation of data. The authors analysed the absorbance spectra and EEMs for Rhone River water samples. However, they did not show any riverine data in figures. The addition of riverine data into Figs. 4, 5, 6 and 7 and related discussion into the manuscript will strengthen the authors'messages."*

Answer: We agree that addition of riverine data into some figures clarifies and strengthes our messages, accordingly:

We introduced in the revised MS results obtained from a kinetic irradiation experiment of the Rhone River sample acquired at Arles station on 7 February 2009. The aim of this experiment is firstly to present absorbance ($a_{CDOM}(350)$, S_{CDOM}) and fluorescence (EEM, CDOM fluorescent peaks, HIX and BIX indices) features of the Rhone River's CDOM. Secondly, it is to show the impact of irradiation on Rhone River's CDOM content. We believe that these data strengthen the discussion section, particularly on the removal of terrestrial CDOM signature at SOFCOM station under Rhone plume intrusion event.

Thus, a brief paragraph concerning irradiation experiment settings was added to the "Materials and methods" section of the revised MS:

"2.5. Irradiation experiment on Rhône River water

A kinetic irradiation experiment was carried out on Rhone River sample collected at Arles station on 7/02/2009 (2 m depth). The 0.2 µm filtered solution was distributed in 50 ml precombusted (450° C, 6 hours) quartz tubes and placed in thermostated bath at 13°C. Samples were exposed to a simulated sunlight using a Suntest CPS + solar simulator (Atlas, GmbH) in Full Sun (FS) light condition (i.e., FS = PAR + UVB + UVA) giving an optical output of 700 W m^{-2}. Exposure for 2.8 hours at this intensity corresponds to a natural daily (12 hours) dose received in the Western Mediterranean Basin by taking an annual average of total solar radiation of 162 W m^{-2} (Ruiz et al., 2008). Quartz tubes were irradiated in duplicate during 8 h (T1) and 20 h (T2) which corresponds to 3 and 7 days of natural solar irradiation, respectively. Simultaneous dark control (quartz tube wrapped in black bag) was performed under the same conditions."

Results concerning 2D EEM irradiation experiment are shown on the Fig.5 in the revised MS ("old" Figs 4 and 5 were combined in the Fig. 4 by removing 3D EEM contour plots of CDOM acquired at SOFCOM station). In addition, corresponding CDOM absorbance and

fluorescence properties as well as fluorescence indices (i.e., HIX and BIX) are added in Tables 1, 2 and 3 of the revised MS and presented in corresponding paragraphs of the results section.

Figure 4 of the revised MS:

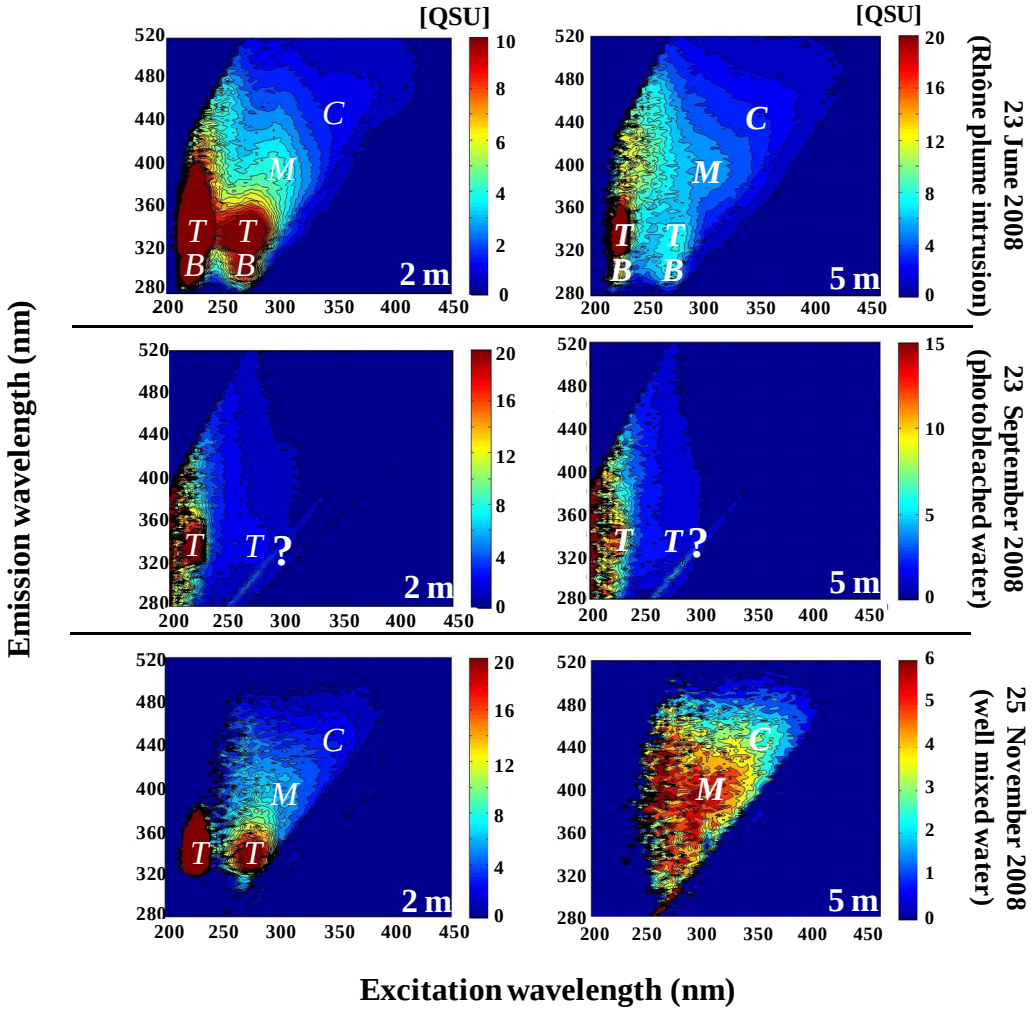

Fig. 4. 2-D EEM contour plots of CDOM (in QSU) collected at SOFCOM station at 2m (left panels) and 5 m depths (right panels) on 23 June 2008 (upper panels), 23 September 2008 (middle panels) and 25 November 2008 (bottom panels). These spectra illustrated fluorescent peaks positions observed during this study.

Figure 5 of the revised MS:

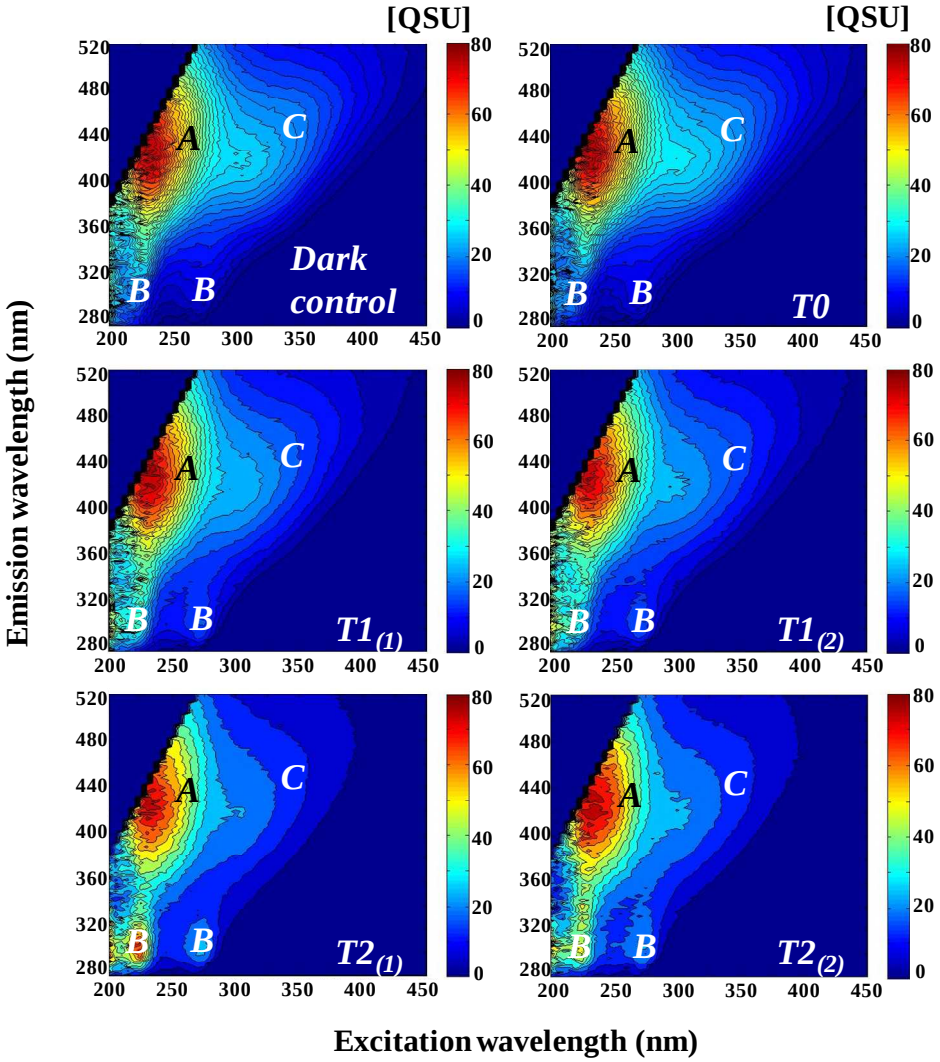

Fig. 5. 2-D EEM contour plots of CDOM (in QSU) obtained from Rhone River sample photo-irradiation experiment at T0 (initial time) and for dark control (upper panels), T1 (duplicate) (middle panels) and T2 (duplicate) (bottom panels).

Table 1 of the revised MS. Absorption coefficient of CDOM at 350 nm [$a_{CDOM}(350)$], spectral slope of CDOM (S_{CDOM}) determined on the 350-500 nm range with a non linear regression, total organic carbon (TOC) concentration , chlorophyll *a* concentration (Chla) at 2 and 5 m depths and mean surface irradiance (E_s) in the UVB (305 nm) and UVA (325, 340, 380 nm) spectral domains measured during one hour close to solar noon on ship deck.

		$a_{CDOM}(350)$ [m^{-1}]		S_{CDOM} [nm^{-1}]		TOC [µMC]		Chla [µg l^{-1}]		E_s(UV) [µW cm^{-2} nm^{-1}]			
End-member	Date	2m	5m	2m	5m	2m	5m	2m	5m	305 nm	325 nm	340 nm	380 nm
SOFCOM [a]	07/11/07	0.11	0.10	0.018	0.019	68	62	_	_	0.51 ± 0.03	12.78 ± 0.39	20.74 ± 0.59	29.17 ± 0.73
SOFCOM	19/12/07	0.10	0.10	0.017	0.018	60	54	_	_	0.14 ± 0.01	9.94 ± 0.06	17.13 ± 0.11	26.46 ± 0.11
SOFCOM	05/02/08	0.11	0.11	0.016	0.015	_	55	0.90	0.92	0.48 ± 0.01	15.72 ± 0.09	25.56 ± 0.17	36.19 ± 0.38
SOFCOM	14/02/08	0.09	0.09	0.018	0.018	78	61	0.20	1.03	0.42 ± 0.01	16.86 ± 0.08	27.90 ± 0.19	38.81 ± 0.23
SOFCOM [a]	26/03/08	_	0.10	_	0.016	56	59	0.21	0.24	1.39 ± 0.03	25.85 ± 0.34	39.09 ± 0.61	52.86 ± 0.98
SOFCOM	29/04/08	0.11	0.11	0.018	0.020	70	63	0.85	0.89	3.09 ± 0.09	36.62 ± 1.25	54.67 ± 2.29	74.18 ± 3.17
SOFCOM [a]	06/05/08	0.13	0.13	0.018	0.018	65	_	1.55	1.69	0.93 ± 0.05	12.83 ± 0.72	18.81 ± 1.08	24.47 ± 1.48
SOFCOM [a]	09/06/08	0.11	0.10	0.022	0.023	70	61	0.77	0.86	2.26 ± 0.09	27.87 ± 1.07	40.55 ± 1.65	53.69 ± 2.57
SOFCOM	23/06/08	0.12	0.11	0.026	0.026	79	76	1.42	1.33	4.64 ± 0.06	39.14 ± 0.25	56.51 ± 0.43	77.51 ± 0.81
SOFCOM [b]	10/07/08	0.09	0.09	0.023	0.023	67	68	0.19	0.20	4.06 ± 0.09	40.14 ± 0.92	58.88 ± 1.35	79.62 ± 1.69
SOFCOM [a]	23/09/08	0.07	0.06	0.021	0.023	72	67	0.40	0.45	1.13 ± 0.12	15.92 ± 1.64	23.38 ± 2.62	30.98 ± 4.06
SOFCOM [b]	14/10/08	0.09	0.09	0.018	0.018	70	67	0.33	0.35	1.17 ± 0.01	19.58 ± 0.08	30.08 ± 0.27	43.75 ± 0.51
SOFCOM	25/11/08	0.13	0.13	0.014	0.014	55	56	0.58	0.56	0.32 ± 0.01	13.73 ± 0.01	22.88 ± 0.01	33.78 ± 0.01
SOFCOM [a]	04/12/08	0.11	0.10	0.017	0.019	63	65	0.76	0.96	0.18 ± 0.01	7.34 ± 0.30	11.65 ± 0.48	15.28 ± 0.62
Rhône estuary [c]	22/05/08	0.25	0.09	0.019	0.021	74	71	_	_	_	_	_	_
Rhône estuary [c]	23/05/08	0.33	0.09	0.017	0.024	78	67	_	_	_	_	_	_
Rhône (Arles) (n=14) [c]	17/01/08-18/11/08	2.42 ± 1.05	_	0.017 ± 0.001	_	136 ± 38	_	_	_	_	_	_	_
Rhône Irrad. Exp. [c]	T0 + Dark control	3.12 ± 0.01	_	0.018 ± 0.000	_	160 ± 6	_	_	_	_	_	_	_
Rhône Irrad. Exp. [c]	T1 duplicate	2.23 ± 0.09	_	0.018 ± 0.001	_	158 ± 2	_	_	_	_	_	_	_
Rhône Irrad. Exp. [c]	T2 duplicate	1.17 ± 0.05	_	0.018 ± 0.000	_	150 ± 0	_	_	_	_	_	_	_

[a] Cloudy day

[b] Sea mist

[c] For Rhône estuary and Rhône end-members, DOC concentration was measured in place of TOC concentration.

Table 2 of the revised MS. Fluorescence intensity (in QSU) and peak positions of tyrosine-like (B), tryptophan-like (T), UVA humic-like (C), marine humic-like (M) and UVC humic-like (A) observed at SOFCOM station at 2 and 5 m depths and Arles station (2 m depth). Emission ranges represent the band from which a mean of fluorescence intensity was calculated. (nd = not determined)

	Peak fluorescence intensity (QSU)									
	B		C		M		T		A	
	Ex/Em (nm) = 275/300-310		Ex/Em (nm) = 350/430-450		Ex/Em (nm) = 300/380-400		Ex/Em (nm) = 275/330-350		Ex/Em (nm) = 260/430-440	
End-member	2m	5m	2m	5m	2m	5m	2m	5m	2m	5m
SOFCOM 09/06/2008	nd	nd	0.56 ± 0.04	0.57 ± 0.04	1.02 ± 0.06	1.24 ± 0.08	1.70 ± 0.18	1.74 ± 0.13	nd	nd
SOFCOM 23/06/2008	11.06 ± 0.81	3.51 ± 0.67	1.40 ± 0.06	1.54 ± 0.08	4.34 ± 0.13	2.73 ± 0.12	14.13 ± 1.57	3.78 ± 0.20	nd	nd
SOFCOM 10/07/2008	nd	nd	0.49 ± 0.03	0.51 ± 0.04	0.85 ± 0.06	0.96 ± 0.06	1.25 ± 0.13	1.46 ± 0.09	nd	nd
SOFCOM 23/09/2008	nd	nd	0.57 ± 0.04	0.42 ± 0.03	1.26 ± 0.07	0.90 ± 0.09	2.77 ± 0.20	1.87 ± 0.09	nd	nd
SOFCOM 14/10/2008	nd	nd	nd	0.27 ± 0.03	nd	0.55 ± 0.08	1.30 ± 0.18	1.58 ± 0.17	nd	nd
SOFCOM 25/11/2008	nd	nd	2.99 ± 0.18	2.85 ± 0.22	5.82 ± 0.49	5.11 ± 0.52	21.94 ± 2.66	nd	nd	nd
SOFCOM 04/12/2008	nd	nd	0.59 ± 0.04	0.34 ± 0.03	0.98 ± 0.05	0.71 ± 0.07	2.08 ± 0.18	nd	nd	nd
Mean	_	_	**1.10**	**0.93**	**2.38**	**1.74**	**6.45**	**1.94**	_	_
SD	_	_	*0.99*	*0.95*	*2.15*	*1.65*	*8.25*	*0.93*	_	_
Rhône (Arles) (Jun-Dec. 2008, n = 6)	7.71 ± 0.84	_	16.72 ± 7.67	_	nd	_	nd	_	41.53 ± 16.54	_
Rhône Irrad. Exp. T0 + Dark control	7.40 ± 1.22	_	20.14 ± 1.14	_	nd	_	nd	_	51.34 ± 1.80	_
Rhône Irrad. Exp. T1 duplicate	9.56 ± 0.59	_	9.54 ± 0.51	_	nd	_	nd	_	29.57 ± 1.48	_
Rhône Irrad. Exp. T2 duplicate	8.34 ± 0.58	_	4.57 ± 0.21	_	nd	_	nd	_	16.77 ± 0.22	_

Table 3 of the revised MS. Values of Humification (HIX; Zsolnay et al., 1999), Biological (BIX; Huguet et al., 2009) indices and the ratio of marine humic-like (Ex/Em = 300/380-400 nm) to humic like (Ex/Em = 350/430-450 nm) (M/C) fluorescence at SOFCOM station at 2 and 5 m depths and Arles station (2 m depth). (nd = not determined)

	HIX		BIX		M/C	
End-member	2m	5m	2m	5m	2m	5m
SOFCOM 09/06/2008	0.93	0.96	1.04	1.00	1.81	2.17
SOFCOM 23/06/2008	0.42	1.22	1.34	1.10	3.11	1.77
SOFCOM 10/07/2008	1.32	1.35	0.86	1.09	1.74	1.89
SOFCOM 23/09/2008	1.04	0.96	1.02	1.06	2.22	2.12
SOFCOM 14/10/2008	nd	0.27	nd	1.12	nd	2.08
SOFCOM 25/11/2008	1.01	0.77	1.26	1.15	1.95	1.79
SOFCOM 04/12/2008	0.35	0.76	1.05	1.11	1.68	2.08
Mean	**0.84**	**0.90**	**1.10**	**1.09**	**2.09**	**1.99**
SD	*0.38*	*0.35*	*0.17*	*0.05*	*0.54*	*0.17*
Rhône (Arles) (Jun-Dec. 2008, n = 6)	4.90 ± 1.60	_	0.74 ± 0.05	_	nd	_
Rhône Irrad. Exp. T0 + Dark control	6.44 ± 0.15	_	0.67 ± 0.02	_	nd	_
Rhône Irrad. Exp. T1 duplicate	4.16 ± 0.16	_	0.67 ± 0.01	_	nd	_
Rhône Irrad. Exp. T2 duplicate	3.21 ± 0.10	_	0.67 ± 0.02	_	nd	_

- In the revised MS, Tables 2 and 3 were also completed with the corresponding averaging CDOM fluorescent peaks as well as with HIX and BIX determined from the Rhone end member (Arles station) during the period where fluorescence data were available (i.e. June - December 08, n=6). Since no PARAFAC analysis was performed, it is difficult to "extract" the peak M of the global fluorescence signal. Thus, the M/C ratio was not determined in Table 3 of the revised MS.

- In the revised MS, emission spectra of the peak C determined at T_0 and at the end of the irradiation experiment (T2) of the Rhone River sample were both added to Fig.6 panel c and d. For the same reason listed above concerning the M peak signature, any emission spectra of the Rhone River M peak could be added on the Fig. 6 as well as Rhone River T peak on Fig. 7.

Figure 6 of the revised MS

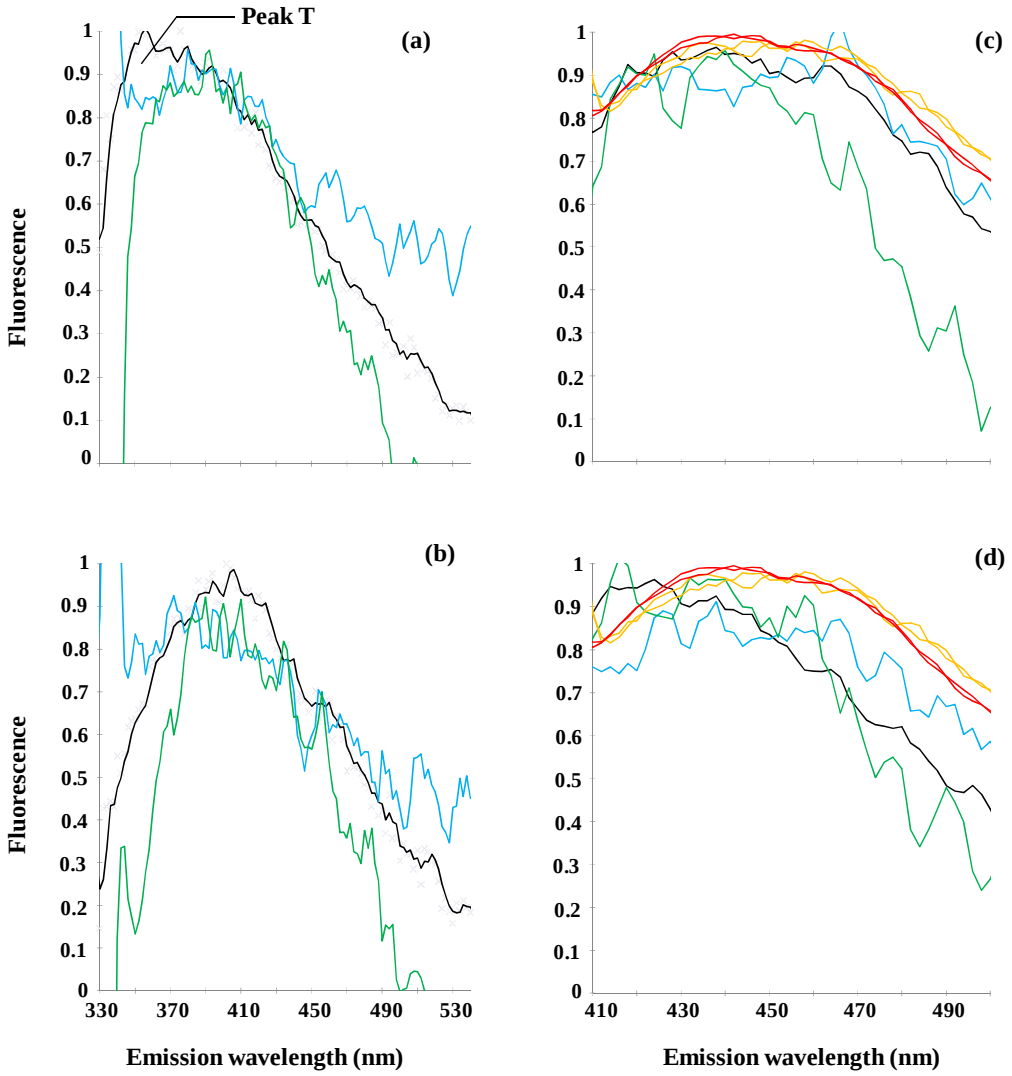

Fig. 6. Normalized emission fluorescence spectra of peak M (a and b) at Ex(λ) = 300 nm and peak C (c and d) at Ex(λ) = 350 nm acquired, at SOFCOM station, on 23 June 2008 (Rhône plume intrusion samples, black line), 23 September 2008 (photobleached samples, blue line) and 25 November 2008 (well mixed sample, green line) at 2 m (upper panel) and 5 m (bottom panel) depths. Normalized emission spectra of peak C determined from T0, dark control (red lines) and T2 (duplicate, orange lines) of the irradiation experiment performed on Rhône River sample collected on 7 February 2009 at 2 m depth were also plotted on both panels c and d. These emission spectra were normalized to the maximum emission intensity in the range 380-400 nm for the peak M and 430-450 nm for the peak C. These spectra were smoothed by a moving average order 3 which imposes a red shifted of 5 nm.

2. *The number of data set in this paper is too small to say something. For example, only one point data (23 September 2008) showed the clear effect of the photodegradation in Fig. 3, and using these limited data the authors discussed too much. I think Addition of some data*

(CDOM characteristics in deep waters) and/or some experiments (photo-irradiation experiments) need to obtain the conclusive messages.

Answer: We agree with the Reviewer, this data set is quite small. However we believe that this data set is a good time series evaluation of surface CDOM properties in a weakly riverine-dominated coastal zone where biological production is a dominant source of CDOM. Indeed these data allows us to point out several potential processes affecting CDOM content in surface waters. Moreover we assume, regarding water depth (60 m), that during mixing events, samples collected in surface waters are representative of the entire water column (as confirmed by CTD data). It is well known that water from depth and water with high terrestrial input have a greater potential for photodegradation than surface waters. This may be due to the prior degradation of surface water DOM by UV exposure, which is difficult to quantify (Hudson et al., 2007). However, as reported by several authors (Del Castillo et al., 1999; Coble, 1996; Coble et al., 1998), photodegradation of DOM may result in a blue shift of Ex/Em maxima along with a diminution in fluorescence intensity. This is attributed to a decrease in aromaticity and molecular weight. Consequently, it seems reasonable for us to evoke photodegradation to explain the particular feature of the sample collected on 23 September 2008 at SOFCOM station, for which a blue shift in peak position is observed.

Specific comments

1. *Page 4, lines 16-17 (Page 5678, lines 16-17): Throughout the introduction section, the authors mainly introduce the environmental dynamics of DOM in coastal environments. Thus, the deep ocean circulation is not suitable in this context. I recommend introducing upwelling and/or vertical mixing instead of deep ocean circulation.*

   Answer: We agree with this comment. Such as, we have also introduced "upwelling and/or vertical mixing processes" in this section but we did not remove "deep ocean circulation process" because the Mediterranean northern continental shelves such as Gulf of Lions are sites of intense vertical mixing and dense water formation during winter due to the intense and persistent continental winds and moderated depth (Vilibic and Supic, 2005; Durrieu de Madron et al., 2005). The dense coastal water eventually overflows the shelf and cascades down the slope, mainly through submarine canyons (Ulses et al., 2008a; Mermex group, 2010). Thus in the revised MS, upwelling and/or vertical mixing processes were added with the following references (Coble, 1996; Parlanti et al., 2000).

2. *Page 5, line 12 (Page 5679, line 12): It would be of help in the readers'understanding, if the authors can provide the value of "the averaged value of fresh waters inputs from rivers into the World Ocean".*

   Answer: The present-day global freshwater flux by rivers is about 41750 km3/ year (Ludwig et al., 1999). But we do not believe that this really informative for the present paper, since the effects are connected to the volume of the basin for example.

3. *Page 7, line 24 (page 5681, line 24): Please clarify the actual pathlength used this study.*

   Answer: We agree with this comment and have completed the actual pathlength used here. This following sentence was added in the revised MS: "Absorbance spectra of marine and freshwater samples were measured through 2 m and 50 cm long pathlengths respectively".

4. *Page 9, line 9-14 (page 5683, line 9-14): Tyrosine-like fluorophore (Ex/Em=270/300) shows the peak at the same region with Raman scatter peak. If the authors normalized the fluorescence intensities of samples using Raman scatter peak of samples, normalized fluorescence intensity should be underestimated. Fluorescence intensities of samples are usually normalized by Raman scatter peak of Milli-Q water which determined at the same day with sample analysis (e.g., Coble, 1996). In this case, I think Raman scatter peak do not correspond to internal standard.*

   Answer: We agree that this part is unclear. Raman normalization was performed using the Raman scatter peak of pure water (fluorescence intensity of Milli-Q water at Ex/Em=275/303 nm). It varied by less 4% during the study period. So we never used the Raman scatter peak of sample for normalization.
   In the revised MS, we replaced this sentence "Before being processed, all the data (blanks, standards, samples) were normalised to the intensity of the water Raman scatter peak at Ex/Em: 275/303 nm (5 nm bandwidths) used as internal standard (Coble et al., 1993; Coble, 1996; Belzile et al., 2006), which varied by less than 4% over the study period" by "Before being processed, all the data (blanks, standards, samples) were normalised to the intensity of the water Raman scatter peak at Ex/Em: 275/303 nm (5 nm bandwidths) of pure water (Coble et al., 1993; Coble, 1996; Belzile et al., 2006), which varied by less than 4% over the study period.

5. *Page 10, lines 11-13 (page 5684, line 11-13): DOC concentration of LCW have been reported to be 1µMC. How did the authors correct high DOC concentration (10µMC) of LCW, namely, system blank?*

   Answer: It is actually a mistake in the text. DOC concentrations of LCW are indeed of 1 ± 0.3 µM C. Change is made in the revised MS. The typical blank value with Milli-Q deionized water was 4-5 µMC.

6. *Page 11(page 5685), lines 19-24 and Fig.2: The satellite imagery at non-intrusion of low salinity waters is necessary in Fig. 2 for comparison.*

   Answer: Yes, we agree with Reviewer. So in the revised MS, we included in Fig. 2 remotely images of sea surface temperature (SST) and chlorophyll concentrations showing the usual Rhone River plume Eastward spreading.

Figure 2 of the revised MS

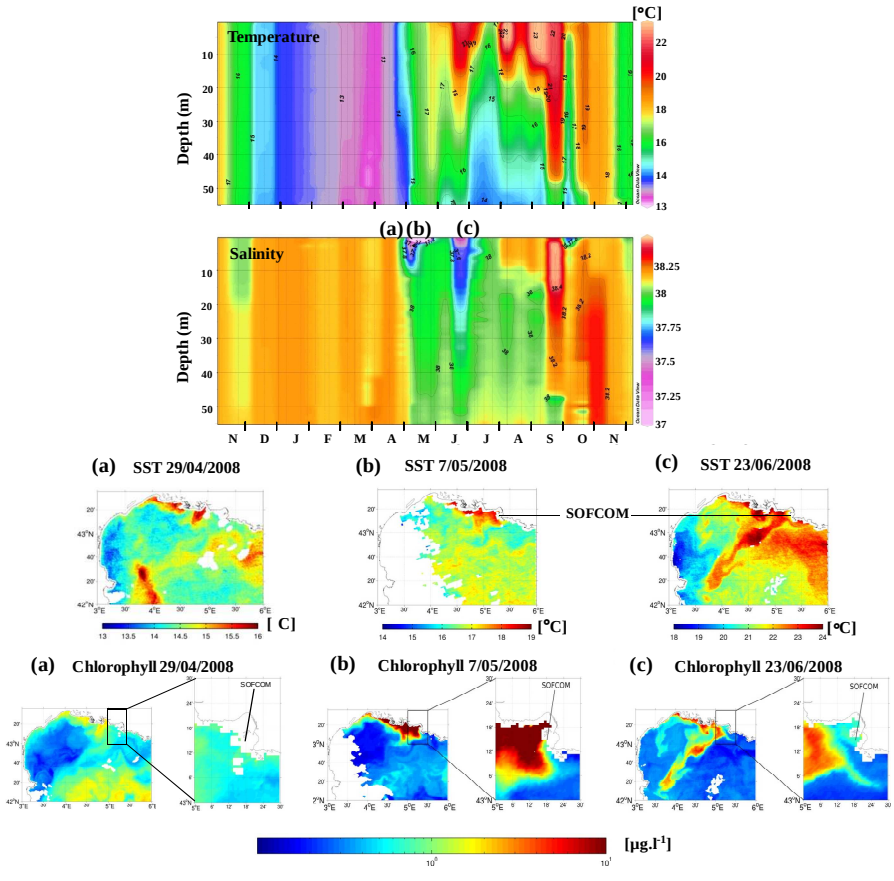

Fig. 2. Top panels: Temporal evolution of temperature and salinity at SOFCOM station from November 2007 to December 2008 from surface to bottom. Data come from CTD profiles carried out twice a month by the SOMLIT network (n = 30) and completed since February 2008 by CTD data acquired on sampling dates (n = 11). Bottom panels: remotely sea surface temperature (SST) and chlorophyll concentrations are from the points in the time series labeled (a), (b) and (c) corresponding respectively to the sampling date 29 April 2008, 7 May 2008 and 23 June 2008. Remotely SST and Chlorophyll concentrations from satellite images were obtained respectively by applying the long-wave SST algorithm and the OC5 coastal-oriented optical algorithm (Gohin et al., 2002; 2005) to water leaving irradiances derived from the Moderate Resolution Imaging Spectroradiometer (MODIS).

7. *Page 11 (page 5685), line 27-page 12, line 3: I could not follow how did the authors estimate the spreading time of Rhone River plume to reach Bay of Marseilles (~2-3 days minimum). Please Explain it.*

Answer: In order to have an estimate of the spreading time of the Rhone River plume, successive satellite pictures were used in order to track the plume. Indeed, using the ones encompassing the Rhone River plume intrusion observed on 6 May 2008, we estimated the spreading time to be on the order of 2-3 days, which is in good agreement with the time scale determined by Fontana et al. (2010).

8. *Page 13 (page 5687), lines 14-16: Please add literatures for this statement "$a_{CDOM}(350)$ for diverse oceanic area (0.046-29.9 m^{-1})".*

   Answer: We added in the revised MS, Kowalczuck et al. (2003) reference for this statement which was slightly modified in the revised MS as following: "$a_{CDOM}(350)$ for diverse aquatic environments (0.046-29.9 m^{-1})"

9. *Page 13 (page 5687), line 24-Page 14 (page 5688), line 7: The salinity data showed the intrusion of low salinity water on 23 June 2008 (Fig. 2), and relatively high levels of CDOM were corresponding to low salinity (Table 2). These results suggest that Rhone River plume contributed the relatively high levels of CDOM. However, highest S values were also observed on 23 June 2008 (the authors introduced that terrestrial CDOM are characterized as low S value). The highest S values observed on 23 June 2008 seem to be inconsistent with low salinity and high levels of CDOM.*

   Answer: Here, when we mention "high levels of CDOM", we refer to the biological fraction of CDOM (i.e. protein-like fluorophores), and not to its terrestrial fraction (i.e. humic-like fluorophores). During its spreading, the Rhone River plume: 1) is enriched in biological CDOM (protein-like fluorophores) released by primary producers (Chla > 1µg l^{-1}) and associated bacteria communities. This biological development is sustained by high nutrient concentrations. 2) is subjected to photodegradation, which leads to a decrease in its humic material content (humic-like fluorophores), as demonstrated from the irradiation experiment presented in the revised MS. These processes explained the high S_{CDOM} values observed in surface waters of Marseilles Bay during such events. In other words, the Rhône River provides rather a biological CDOM fingerprint than a terrestrial CDOM fingerprint to the surface waters of the Bay of Marseilles. Hence, we think the highest S values observed on 23 June 2008 are consistent with low salinity and high levels of (biological/freshly produced) CDOM.

10. *Page 15 (page 5689), lines 21-25: I have concerns regarding a strong fluorescence signal in short Ex wavelength found on 23 September 2008. I could see such signal only in EEMs on 23 September 2008 in Figs 4 and 5. The sudden disappearance of these fluorophores, i.e., nearly 0 of fluorescence intensity, is curious for me. Xenon lamps usually show very low outputs in short Ex wavelength. Thus I guess part of the huge difference in fluorescence in short Ex wavelength was due to artifact.*

    Answer: Yes, this is very puzzling and not fully understood, but is consistently found in samples from the clearest (bluest) ocean waters. Since this signal appeared only on 23 September 2008 and since it is not observed in MilliQ water, therefore it cannot be considered as artifact. It is true that Xenon lamps have very low outputs in short wavelengths. However, the spectrofluorometer we used for this study (Hitachi F-7000) has been carefully corrected for Ex and Em instrumental responses over the range 200-600 nm according to the procedure

recommended by Hitachi (Hitachi F-7000 Instruction Manual). The Xenon lamp spectrum (Ex instrumental response) has been corrected using a concentrated solution of Rhodamine B as standard (quantum counter) and a single-side frosted red filter in Ex scan mode. We believe this higher fluorescence signal in short wavelengths actually corresponds to the effects of photodegradation as already reported by Coble (1996) and Coble et al. (1998).

11. *Page 18 (page 5692), lines 14-19: I was confused by these sentences. The authors pointed out that biologically freshly produced CDOM showed high S value, but also mentioned that low S value suggest the presence of humic CDOM from deep waters.*

    Answer: We mean that humic CDOM (higher relative contribution of peaks C and M) showed lower S values compared to biologically freshly produced CDOM (higher relative contribution of peak T). Indeed, humic CDOM is made up of high molecular weight compounds absorbing at long wavelengths, whereas freshly produced CDOM is composed by in low molecular weight material absorbing at shorter wavelengths.

12. *Page 19 (page 5693) line 10-page 20 (page 5694) line 2: The authors should show the analytical errors of HIX, BIX and M/C ratio for discussion described here. Fluorescence spectra shown in Figs. 6 and 7 seem to have relatively large noise compared to fluorescence signals. Such noise may significantly affect the values of HIX, BIX and M/C ratio.*

    Answer: On average, the duplicates were consistent within 5% with regard to the peak intensities and index determinations, and within 2% with respect to the locations of Em peak maxima, whereas no difference was observed for the locations of Ex peak maxima. Thus this analytical error was reported in “Material and methods” section of the revised MS. Thus the accuracy of these measurements did not affect interpretation results.

Technical comments

1. *Page 5, line 10 (p 5679, line 8): TOC should be total organic carbon (TOC) here.*
   Answer: This correction was made in the revised MS

2. *Page 13, line 16 (p 5687, line 16): 5 June 2008 should be 6 May 2008.*
   Answer: This correction was made in the revised MS

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