Reviewer 1

The study is well designed for capturing storm induced variation over the upper with in-situ observations from glider and cruise. Its impact is further quantified with atmospheric model and satellite observations. The center of storm is mostly captured along the glider track and the storm induced dynamics is clearly identified. Findings are generally persuading and interesting. A minor revision is suggested for addressing the following comments before the paper being accepted for publication.

The authors would like to thank you for your precious time, and positive and constructive comments. We have carefully addressed all the comments, questions and suggestions. All of them will be included in the revised version of the manuscript.
(Color legend : comments and questions in green, answers in blue, new text proposal in orange)

Major comments:

1. What is the spatial resolution and quality for the satellite observations? Though multiple algorithms are applied for the chlorophyll dataset and their results are highly consistent, the cloud coverage can be an issue for contaminating the observations. More details are needed to describe the measurements.

Yes, you will find below the information on all the products. We propose to put in the text only the ones used for the results (in orange).

. SSH and associated geostrophic currents

- "MEDITERRANEAN OCEAN GRIDDED L4 SEA SURFACE HEIGHTS AND DERIVED VARIABLES" (SEALEVEL_MED_PHY_L4_NRT_OBSERVATIONS_008_050, now SEALEVEL_EUR_PHY_L4_NRT_OBSERVATIONS_008_060, https://resources.marine.copernicus.eu/product-detail/SEALEVEL_EUR_PHY_L4_NRT_OBSERVATIONS_008_060/INFORMATION) : 0.125° x 0.125°, multi-satellite

. SST

- "MEDITERRANEAN SEA - HIGH RESOLUTION AND ULTRA HIGH RESOLUTION L3S SEA SURFACE TEMPERATURE (SST_MED_SST_L3S_NRT_OBSERVATIONS_010_012, https://resources.marine.copernicus.eu/product-detail/SST_MED_SST_L3S_NRT_OBSERVATIONS_010_012/INFORMATION) : 0.01° × 0.01°, strict temporal window (local nighttime), to avoid diurnal cycle and cloud contamination. provides supercollated (merged multisensor, L3S) SST data remapped over the Mediterranean Sea.

- "MEDITERRANEAN SEA HIGH RESOLUTION AND ULTRA HIGH RESOLUTION SEA SURFACE TEMPERATURE ANALYSIS (SST_MED_SST_L4_NRT_OBSERVATIONS_010_004, https://resources.marine.copernicus.eu/product-detail/SST_MED_SST_L4_NRT_OBSERVATIONS_010_004/INFORMATION): 0.01° × 0.01°, nighttime images, multi-satellite

. Chl

- "GLOBAL OCEAN CHLOROPHYLL FROM SATELLITE OBSERVATIONS" (OCEANCOLOUR_GLO_CHL_L3_NRT_OBSERVATIONS_009_032, now

OCEANCOLOUR_GLO_BGC_L3_NRT_009_101, https://resources.marine.copernicus.eu/product-detail/OCEANCOLOUR_GLO_BGC_L3_NRT_009_101/INFORMATION): 4km x 4km, ACRI-ST company, multi-satellite, hereafter called Chl_ACRI

- "MEDITERRANEAN SEA SURFACE CHLOROPHYLL CONCENTRATION FROM MULTI SATELLITE OBSERVATIONS" (OCEANCOLOUR_MED_CHL_L3_NRT_OBSERVATIONS_009_040, now OCEANCOLOUR_MED_BGC_L3_NRT_009_141, https://resources.marine.copernicus.eu/product-detail/OCEANCOLOUR_MED_BGC_L3_NRT_009_141/INFORMATION): 1km x 1km, multi-satellite, hereafter called Chl_MEDOCL3

- "MEDITERRANEAN SEA DAILY INTERPOLATED SURFACE CHLOROPHYLL CONCENTRATION FROM MULTI SATELLITE OBSERVATIONS" (OCEANCOLOUR_MED_CHL_L4_NRT_OBSERVATIONS_009_041, now OCEANCOLOUR_MED_BGC_L4_NRT_009_142, https://resources.marine.copernicus.eu/product-detail/OCEANCOLOUR_MED_BGC_L4_NRT_009_142/INFORMATION): 1km x 1km, multi-satellite, hereafter called Chl_MEDOCL4

Concerning the cloud coverage: yes, it can be an issue as the L4 Chl product, filling the cloud gaps with climatology, is not very accurate in our case, as can be seen in Fig.3a where the correlation between Chl_MEDOCL4 and in situ is worse than the one between Chl_MEDOCL3 and Chl_insitu. Nevertheless, the purposes of using satellite products are :

- having a synoptic view for cruise guidance (using SPASSO) and general hydrodynamic zones determination (Fig 4a)
- perform a qualitative comparison with Chl_insitu to assess the question of the Chl satellite performance with respect to data. The answer is that the qualitative performance is good in general, and follows the in situ trend, but that the quantitative performance is not sufficient, especially as far as the storm effect is concerned (see Fig. 10b).

2. The storm induced variations are largely varying depending on the feature of the storm. For example, prominent changes are identified with storms with large intensity and slow moving (Wang, 2020). The frequency of storm and their associated intensities in the Mediterranean Sea should be described; thus, the readers have a better understanding for the representative of investigated storm.

We will add some more details to the paragraph L215-219, that will be moved to the discussion.

"The analysis of 30 years of coastal data in the South of France (Toulon) by Meteo France shows that winds of intensity > 100 km h^{-1} occur on average 8 times per year, but only once every 4 years in May. Concerning winds of intensity > 130 km h^{-1}, they occur on average once every 2 years, and once every 30 years in May (http://tempetes.meteo.fr/spip.php?article221)"

→ “The analysis of 30 years of coastal data in the South of France (Toulon and Marignane) by Meteo France shows that the typical periods of wind occur at the end of winter and middle of autumn. In Toulon, winds of intensity > 100 km h^{-1} occur on average 8 times per year, but only once every 4 years in May; winds of intensity > 130 km h^{-1} occur on average once every 2 years, and once every 30 years in May. The total occurrences of different wind intensities for the whole 1981-2010 period are shown in Table 1 (http://tempetes.meteo.fr/spip.php?article221).”

		> 100 km h^{-1}	> 110 km h^{-1}	> 120 km h^{-1}	> 130 km h^{-1}
Toulon	Tot	232	96	36	14
	May	8	1	1	1
Marignane	Tot	205	60	13	5
	May	6	0	0	0

Our episode of storm is rare both in intensity and period of the year, consequently not representative of the general climate until 2010 in the NW Mediterranean Sea. Nevertheless in the future important changes in both the frequency and the intensity of Mediterranean storms are expected (Lionello et al., 2006; Flaounas et al., 2021).

We will add in our discussion a reference to your suggested paper Wang, 2020 (see next comment).

3. The storm didn’t necessary induce elevation in phytoplankton, especially in the stratified ocean with prominent subsurface chlorophyll maximum (Figure 13a). Similarly, there was no net increasing in chlorophyll resolved in the BGC-Argo observation in the northwest Pacific after a strong typhoon (Chai et al., 2021). The observed elevation in chlorophyll may be due to a redistribution, which should be further examined for different depth.

Yes, this is also our interpretation, thanks to the glider observation and Fig.13a and Fig.13b, that the increase in the surface Chl is most likely due to the dilution of the DCM, not an overall increase in depth. In addition, in our case the increase in nutrients seems to be linked to the uplift of the nitracline.

L300 : “However, the integrated fluorescence content in the upper 100 m did not show any noticeable variation (Fig. 13b). This indicates that the increase in chla concentration observed near the surface (Fig. 6) was likely due to the dilution by vertical mixing of the phytoplankton cells within the mixed layer.”

Chai et al. 2021 says tropical and subtropical typhoons in open and deep waters do not always mix deep enough to allow the nutricline to reach surface waters, avoiding growth

enhancing while ocean color shows increase in chla concentration. A sentence using this paper and Wang 2020 will be included in the manuscript discussion:

“Typhoons can be compared to the type of storm observed in our study only by the intensity and duration of the winds triggering a fast decrease of surface temperature and an increase in surface chla. Most of the typhoons enhance chlorophyll surface concentration (Wang et al., 2020). Nevertheless, in open water tropical and sub-tropical areas, dilution phenomenon of the deep chlorophyll maximum after typhoons was warned to be source of overestimation of potential phytoplankton production when using only satellites observation, because the nitracline is not always affected (Chai et al., 2021). In our case, the deepening of the mixing due to the storm was accompanied by an increase in surface nutrients that could only be linked to the uplift of the nitracline, as we were far enough from coastal run-off influences. This mixing was related to the spreading and the increasing of the phytoplankton in the upper layer, leading to a possible dilution of the grazers favouring the pico-nanophytoplankton accumulation in the shallowing mixed lays a few days after (Morison et al., 2019). ”

Minor comments:

1. The color shading for the boxes in Figure 3(a) is misleading. Please adjust to the same kind of color with different intensity.

Yes, we will change to shades of blue.

2. Ticks on the yaxis are misleading in Figure 11(b) since three curves with two axes. What is the meaning of the background shading?

It was indeed not straightforward to visualise that the green and red curves share the same axis and that is why we have put the title in green and the labels in red. A sentence will be added into the caption to make this point clearer: "The vertical axis tick colors indicate the associated curve. Similarly, ticks labels and titles written in two different colors indicate that two curves are associated with the same axis."

Similarly, the horizontal grid lines were misleading and will be removed. Finally, a sentence giving the meaning of the background shading meaning was added in the caption of Figure 11b: “Illustration of the newly-mixed waters (in cyan spans) and their direct surroundings (NC waters, in yellow spans)” → “Illustration of the newly-mixed waters (corresponding to the cyan background) and their direct surroundings (NC waters, corresponding to the yellow background)”

3. There are some inconsistencies in the formatting, like Line 252 the paragraph didn’t finish.

Thank you, we will review the remaining inconsistencies in the formatting through the whole document.

4. Please modify the location where the figures to be embedded as many figures are inserted in the middle of a paragraph.

Yes, we will modify the figures location and avoid embedding them in the middle of paragraphs.

Chai, F., Wang, Y., Xing, X., Yan, Y., Xue, H., Wells, M., Boss, E. (2021), A limited effect of sub-tropical typhoons on phytoplankton dynamics. Biogeosciences, 18(3), 849-859.

Wang, Y. (2020), Composite of typhoon induced sea surface temperature and chlorophyll-a responses in the South China Sea, Journal Geophysical Research: Oceans, 125, e2020JC016243.