EGUsphere, referee comment RC1
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Comment on egusphere-2022-31

Anonymous Referee #1

Referee comment on "Upper-ocean response to the passage of tropical cyclones in the Azores region" by Miguel M. Lima et al., EGUsphere,
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The authors examine the oceanic response to tropical cyclones (TCs) in the Azores region, where relatively small numbers of TCs have been observed so far. They found the clear response of chlorophyll (Chl-a) as well as sea surface temperature (SST), and showed the importance of the TC intensity. I think that the results are overall interesting. However, there are several points to be clarified. I would like the authors to respond to the specific issues listed below before the manuscript will be considered for publication.

Major comments

1. As mentioned in the introduction, one important dynamical process is the Ekman pumping that sometimes leaves significant cold wake behind TCs. Is this process not important in the area of focus? The authors seem not to refer to this aspect in the results. For example, the authors suggest that thermodynamic exchanges should be important for the impact of Hurricane Ophelia on SST at the initial phase (L263-265), but the Ekman pumping still remains to be examined, if I understand correctly.

2. L88-90. Does the interpolation of data affect the results? Because the ocean is usually covered by clouds in TCs, the results might be affected to some extent by the interpolation. Please show what percent of the area analyzed was covered by clouds and discuss the influence on the results.

3. L166-175. The method needs a bit more explanation. How does the algorithm detect the changes in SST and Chl-a? The brief summary may help understand the results. Do the authors use the same time windows for all TCs? The appropriate windows could change, depending on the properties of TCs such as the translation speed and size. Does the use of the same time windows affect the results? I expected that the decrease in SST is not always coincident with the increase in Chl-a, because their changes may depend on

not only TCs but also the oceanic conditions. Can we reasonably assume that they occur at the same time? Another thing is that if we focus on the maximum anomalies during the periods after the passages, can we obtain almost the same results? I expect that the same time windows may blur the nature of the oceanic response.

4. Results. In this study, the difference in location seems to be not taken into consideration. Is it a reasonable assumption that the ocean responds to TCs in the similar way in this region?

5. L215-227. The properties of TCs change greatly while they move with time, and especially the translation speed may be quite different between the initial and mature phases, as seen from Figure 6. So each plot in Figure 5 indeed has a broad range. I wonder if the average of the translation speed makes sense when comparing to SST and Chl-a anomalies.

Other points

L71-72. What does it mean by "in relation to the rest of the north Atlantic basin"?

Methodology. The first two paragraphs are a bit redundant, because most information is already given in the introduction and data sections. Please briefly describe the points.

Figure 7, right panels. Color panels are easy to see, like in Figure 6.