Ocean Sci. Discuss.,
https://doi.org/10.5194/os-2018-133-RC2, 2019

Ocean Science
Discussions

Interactive comment on "Eddy-induced Track Reversal and Upper Ocean Physical-Biogeochemical Response of Tropical Cyclone Madi in the Bay of Bengal" *by* Riyanka Roy Chowdhury et al.

Anonymous Referee #1

Received and published: 11 March 2019

I am grateful for the authors' replies. Although the presentation of the paper might have been improved, I can not confirm it at the present moment, because I cannot find the revised paper in the web now. Therefore, my comments are only for the replies.

For the biogeochemical oceanic response to a storm, I understand that the observation itself is new. However, the authors did not reply (and revise) the following scientific themes: What kind of processes did the oceanic response occur by? What effects did the response have on?

I also understand that there was a sudden change in the biogeochemical components such as Chl-a and outgassing of CO2 from the background before the passage. However, the authors have not shown any evidence of the difference quantatively from the present study to Bate et al. (1998) and Nemoto et al. (2009). According to Wada et al. (2011), the amount of outgassing of CO2 is greatly affected by the error of surface wind speed analysys data. Therefore, I think that the difference the authors found is not a new finding but the result including the observational error.

I am not convinced that the cold eddy controlled the movement of the typhoon (arresting of the northward movement). I understand that the results of absolute vorticity budget analysis do show the processes that dominates the storm by solving the given atmospheric field diagnostically. However, I confirm that the authors' analysis did not clarify the relation between the vorticity balance and oceanic cold eddy scientifically although the timing that a storm was arresting of the northward movement matched when a storm was over the cold eddy.

The fact that the vertical shear is small and the moving speed is slow is also related to the environmental steering flow of the storm. In such an environmental field, the axis of the storm tends to stand up, the storm weakened due to sea surface cooling, and the influence on the inner-core structure become more clear. This is a well known mechanism about tropical cyclone-ocean interactons. However, the authors do not show the influence of the intensity and structure of the storm on the environmental steering flow. Therefore, the authors do not demonstrate the mechanism regarding the arresting of the northward movement over the cold eddy. Conversely, it is easy to understand the arresting of the northward movement over the cold eddy led to decreases in TCHP and increases in Chl-a and outgassing of CO2.

Therefore, I recommend that this paper in the present form is not worthy of publication.

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