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Interactive comment on "Global representation of tropical cyclone-induced ocean thermal changes using Argo data – Part 1: Methods and results" *by* L. Cheng et al.

Anonymous Referee #2

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I am providing a short review entitled "Global representation of tropical cyclone-induced ocean thermal changes using Argo data – Part 1: Methods and results" by Cheng, Zhu, and Sriver. This manuscript is to introduce a method to obtain the averaged ocean response to tropical cyclones (TCs) by using Argo float data. However, I believe the method inevitably contains a couple of caveats as following. (1) The way to get the mean ocean response to tropical cyclones in the manuscript is to average the response for each TC at first, considering as a representative response for the TC and then to average the mean responses for the whole TCs. Since ocean responses to TC have highly skewed probability distributions and the TC intensity itself has skewed distributions as well, because even a single TC has strong intensity only for a short period

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of time. If there were enough Argo pair samples for each individual TC, the authors' approach might have provided a similar result as the true mean ocean response. Yet, in reality, the number of Argo pair samples for each TC may be very small, so that the individual mean values may not be a proper representative of mean ocean response to each TC. (2) The number of Argo pair samples greatly varies with TC cases. Error of the mean responses must depend on the number of pair samples for each TC. However, when averaging these mean responses again for the whole TCs, they just assumed all the mean values had same qualities, but it is not true. The average should be a weighted mean considering quality of each mean response.

The authors should properly describe these problems of their method and test the sensitivity using such as the boostrap method. The final comment of mine is to merge the method part and result part, so as to help readers understand their results considering limitation of their method.

Therefore, I am afraid that I cannot recommend publishing their manuscript unless revising the method part thoroughly and carefully.

Interactive comment on Ocean Sci. Discuss., 11, 2831, 2014.