

Interactive comment on “Excitation of equatorial Kelvin and Yanai waves by tropical cyclones in an ocean general circulation model” by R. L. Sriver et al.

Anonymous Referee #2

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Review for “Excitation of equatorial Kelvin and Yanai waves by tropical cyclones” by R. L. Sriver et al. General comments: This manuscript describes a numerical investigation on how tropic cyclones (TC) can generate the tropical Kelvin and Yanai ocean waves. The main approach of this study is to compare the two sets of numerical model simulation (i.e. model run with modified TC winds or without TC winds: the control run). By presenting model results with TC winds as anomalies relative to the control simulation with the mean difference being removed, the authors indicated the waves excited by TC winds as an eastward-propagating warm temperature anomaly compared to the control simulation.

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In principle, this could be a very interesting manuscript. However, there are some fundamental shortcomings in the submitted manuscript: 1) personally, I don't feel comfortable with the model configuration. i.e. modified the atmospheric forcing (years 1994–2000) to include TC wind fields between 2000-2006 and scale it by 2X, I feel it became too unrealistic and arbitrary. 2) Model results lack sufficient validations from observational data and the discussion on the dynamics regarding how the TC generated the ocean wave could be more in-depth. I therefore do not recommend publishing this manuscript in its present form. These flaws are noted in detail in the comments below.

Specific comments: 1. Could you show a figure of modeled ocean status (e.g. temperature) rather than only the anomaly? It is important to convince the readers at the first that it is a "solid" model and able to capture the dominant characteristics of the studied region. 2. What are the wave speed of the modeled "Kelvin" and "Yaina" wave, explicitly? Is it in accord with the analytic solution or realistic observation? 3. In Figure 3, how much heat (not only temperature) anomaly was transported eastwards, is it comparable to TAO data? 4. Instead of artificially "blending and scale" the wind forcing of 1994-2000 and 2000-2006 and just present the results, would be it possible to design some idealized cases by using more idealized TCs and even simplified ocean geometry in order to develop an analytic solution? Therefore you would have both model results and analytic solution so that you can show the mechanism of wave-generation by TC clearly, or even develop a theory and find critical value (how often or how strong the TC has to be to induce these waves from the theory). 5. It would be scientifically interesting either going for a more in-depth theoretic research as mentioned above or a more realistically and solid model simulation, in this way you must show a reliable model and good model-data comparison quantitatively, so that you could provide accurate information such as how much heat was transported; how much mixing was induced, how quick the wave could be induced or damped during different TCs etc.

Interactive comment on Earth Syst. Dynam. Discuss., 3, 999, 2012.

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