

Interactive comment on “Revisiting Tropical Instability Wave Variability in the Atlantic Ocean using SODA reanalysis” by Hatsue Takanaca de Decco et al.

Anonymous Referee #1

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This manuscript attempts to investigate the seasonal variability and the generation mechanism of tropical instability waves (TIWs) in the Atlantic Ocean using reanalysis data. Unfortunately, the manuscript is highly disorganized and diffuse, and I am left wondering what the new finding of this work is. Below are some examples of those points which definitely need further improvement. I am afraid that the manuscript is not suitable for publication in Ocean Science.

1. It appears that one of the major conclusions of this work is that barotropic instability is the main generation mechanism of TIWs in the Atlantic Ocean. However, the importance of barotropic instability in generating TIWs has already been pointed out by numerous previous studies. Just confirming a well-known fact using a different data

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set is not sufficient to be a paper suitable for Ocean Science.

2. Another important conclusion of this manuscript is that the intensity of the barotropic energy conversion rate varies in the annual and semi-annual cycles, which is shown by performing spectral analysis. But this is again a quite natural result.

3. The authors note that “the TIW eddy kinetic energy was almost constant at seasonal scale (Pg. 10, Line 340),” but they also note that “the present analysis revealed and reinforced the intense seasonality of TIWs (Pg. 11, Lines 379–380).” Which is the correct message?

4. I cannot understand what Figure 9 shows. The authors conclude that TIWs vary annually based on this figure, but if this figure is the power spectra of temperature and other variables (as described in the figure caption), the spectral peak at the annual period cannot be a signal of TIWs, whose period is ~30 days.

5. The introduction section is especially too diffuse. The authors should summarize the results of previous studies and remaining issues in a more organized way and state the specific purpose of the present study more clearly.

6. The authors seem to emphasize the use of “bidirectional filter” (spatial and temporal filter) in their spectral analyses. If this method is the important progress in the present study, they should demonstrate the advantage of using this filter in comparison with a filter in space or time domain alone.

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