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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Signals of El Niño Modoki in the tropical tropopause layer and stratosphere" *by* F. Xie et al.

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Reviews on "Signals of El Nino Modoki in the tropical tropopause layer and stratosphere" by Xie et al.

General comments:

El Nino Modoki is a mode of tropical SST interanual variability identified in recent years. How the atmosphere responds to such an interannual SST mode has been a hot topic in recent years. In the paper, the authors performed comprehensive studies on responses of the tropopause and the stratosphere to El Nino Modoki and compare it with that responding to the conventional mode of El Nino, using reanalysis and satellite data as well as GCM simulations. They show significant different responses of the tropopause and stratosphere to the two types of El Nino. Especially, their simulations greatly help us understand this issue. The paper is acceptable in general sense. The

following specific comments are for the authors to make minor changes.

Specific comments:

1. In many places of the paper, the authors say their results are consistent with previous studies. It sounds like that the paper does not make new progress, although it is not the case. It would be better to make it clear: what is new in the present paper, and what has been done by others.

2. In general, the paper is written well and readable. However, it appears that there is space of writing improvement. I will list some errors below. I hope the authors check the paper carefully.

3. Figures 4, 5, 7: The spatial patterns in these figures look very like tropical Rossby wave modes responding to stationary equatorial heating or stationary tropical SST anomalies. If authors agree with this, it would be great to address this in interpreting their results. It may also be a topic for future studies.

4. Section of stratospheric water vapor: Is it possible to interpret why water vapor has such vertical distributions in Figure 8.

5. Interaction with QBO: the results of QBO experiments are interesting. However, it would be better not to attribute the simulation results to linear or nonlinear interaction or overlap. This is because the forced QBO would modify tropical stratospheric flows. Changes in tropical stratospheric flows consequently influence tropical wave modes excited by tropical SST anomalies. Thus, it is complicated sequences, rather than linear interactions.

6. Page 3620, L27: However → By contrast

7. P3623, L7: delete "the " after between,

8. P3623, L18: analyses → analyzes,

9. P3624, L24: recorders → records

10. P3625, L4: than can be → than that can be

11. P3627, L4: with the results of → with that of

12. P3627, L27: than do → than typical El Nino activities do

13. P3633, L5-L10: Figure 9a shows decreased EP fluxes. It indicates that wave-driven dynamic heat is reduced in the polar region. This could be the major reason in causing polar cooling. Of course, the decrease in EP fluxes should cause less ozone transported to the polar region.

14. P3633, L20: Nevertheless → In contrast

15. P 3634, L1: contributes to → is associated with

16. P 3637, L9: time series data → data

17. P3637, L14: canonic Modoki events → canonic El Nino events?

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 3619, 2012.