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Interactive comment on “On the presence of equatorial waves in the lower stratosphere of a general circulation model” by P. Maury and F. Lott

Anonymous Referee #2

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General Comments

This is a nice, consistent and interesting analysis on the KW and RGW in the LMDz GCM compared with the ERA-Interim reanalyses in the stratosphere. I recommend publication with a few minor comments, detailed below.

Specific Comments:

Section 2.1: which kind of simulations have been performed with GCM? which SSTs have been used and how long are the simulations? Which GHGs, aerosol, O₃ etc. . . ?

Fig1: how many years of GPCP have been use to create fig 1?

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Fig 2-3: Are these kind of spectra already been published on GPCP? Or are these in agreement with similar spectra published on other datasets? Would it be possible to add the period on the right axis? Are the 1997-2008 period the same for the LMDz model simulations if observed ssts have been used? How are those spectra in agreement with those derived from the OLR (see Maury et al 2011)

Section 4.2 and 4.1, in order to better compare with reanalyses, given the role of wave filtering by the wind, why not performing this analysis only in a specific qbo phase in era-interim?

Figs 8-9, I have missed the discussion about panels c)

Section 6, lines 10-12: here you suggest that there exist other sources than equatorial convection because of the disagreement in the precipitation spectra between model and observations, however, above this was explained as the role of filtering by the wind. Could you clarify your point?

page 22620, lines 4-6. Could you please specify that those are again composites on the KW index ?

Fig 10: x and y axes are unreadable

The composites do not show any significance level, this could be especially important for the EP fluxes, as it is the first time I see those kind of composites (e.g. EP fluxes on KW and RGW indices). For the EP fluxes, could you also add a panel with a climatology ?

In order to understand composites, it could be important to know if there is any trend in GHGs or O3 etc. . . and to know if there is any trend on the indices and EP fluxes (in reanalyses as well). For example, does the large signal on the EP flux at 50S, have anything to do with trends on the tropospheric eddy driven jet? Are we just correlating trends when performing the composites (trend in the indices and trend in the EP fluxes)? Or is there a real physical mechanism?

Moreover, have you seen if in those trends the largest contribution is from the wave 1-2 ? I mean, if you separate EP fluxes from wave 1-2 w.r.t EP fluxes from synoptic waves (e.g. 5 and higher) and then you composite, do you see their contribute comes from different regions in the SH?

other typos/minors:

Section 5: lines 9-10. Could you add at the end something like "as explained below" ?

page 22609, line 26: " the differences with the models in Horinouchi et al. (2003) are not just their convection schemes" → within the models? among the models ?

p 22610, line 3: analyses → analyse or analyze (it's a verb)

beginning of sections: 4.2, 4.3: The Fig. 5, The Fig. 4 → Fig.5. . . Fig.4. . .

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