

## Anonymous Referee #2

Many thanks for reading our manuscript and your comments.

Please find our answers to your comments.

General assessment: The authors develop a clean case study of a phenomenon that is otherwise not yet well represented in the literature, but which confirms earlier studies on stratosphere - troposphere coupling on wave reflection and the impact of the tropical lower stratosphere on tropical convection. The study is well documented, but could use a consolidation of figures for clarity. Overall, the case study is well written and supported by the recent literature, mainly from the authors themselves. This study is worth publishing after minor revisions to the text and figure.

Detailed assessment:

page 1, line 25: "downward penetration of zonal winds" is misleading, it should rather be called a downward propagation of anomalies, cite e.g. Plumb & Semeniuk (2003).

Some peoples consider that the term "propagation" is not appropriate, because the process in the stratosphere is not exactly the same as that in the troposphere.

In the case of Plumb and Semeniuk (2003), they prescribed periodic variation of tropospheric wave source and argued that the downward "migration" of zonal winds does not necessarily reflect downward influence from the stratosphere. Therefore, they addressed a somewhat different problem from the present study.

page 2, line 4: "external forcings in the stratosphere": external to the troposphere?

External to the atmosphere, such as the solar forcing as described in the following sentences.

page 2, line 5: "ozone depletion"?

Ozone depletion due to ozone depleting substances (ODS)

page 2, line 8: please add a reference

Reference added: Kodera et al. (2016b)

page 2, lines 8 - 10: It would be helpful to explain the MASTJ itself before looking at its impact. One option would be to move part of the first paragraph in section 3.1 (page 3, lines 15 - 20) to the introduction.

According to the comment, the paragraph has been moved to the introduction.

page 2, line 16: nearly?

This means that it is not exactly until winter solstice.

page 3, line 26: remove "in"

Removed

page 4, line 20: "largely" -> "strongly"

Modified

page 5, line 2: where does the 12 come from?

12= 3 (days) x 4 (days interval between (n+2) and (n-2))

For easier understanding, the equation has been rewritten as follows.

$$\Delta U_n = [(U_{n+3} + U_{n+2} + U_{n+1})/3 - (U_{n-3} - U_{n-2} - U_{n-1})/3] / 4.$$

page 5, line 6: growth -> grow

Corrected

page 5, line 8: it looks more like divergence in the polar regions, please be more clear in the description previous

"Waves in the stratosphere converge more at higher latitudes, ...." This sentence describes the change from the end of November to the beginning of December, as mentioned in the preceding two sentences. Convergence of the EP-flux is evident at higher latitudes on 8 December as illustrated below. According to the comment, the word "December" is added in the phrase as follows.

"...converge more at higher latitudes in December."

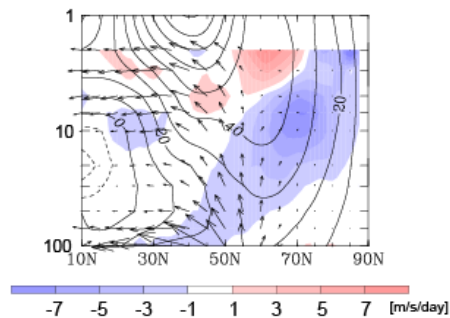


Figure 1: a) missing in caption

Added.

Figure 2a): there seems to be a similar structure in the SH as in the NH, but much weaker.

The structure of both hemispheres is compared in the following figure. Meridional structure of zonal winds looks rather different.

