Authors' response to the Reviewer #2 comments on "Representation of solar tides in the stratosphere and lower mesosphere in state-of-the-art reanalyses and in satellite observations" by T. Sakazaki et al.

We appreciate the efforts of the Reviewer to evaluate our manuscript. Below we provide our specific responses to each of the Reviewer's points. Below we reproduce the Reviewer's comments verbatim in a **blue font** while our responses are in a standard **black font**. We point to changes in the manuscript with line numbers in **red font** referring to the version of the manuscript with tracked changes shown.

Recommendation: Accept after minor revision
The authors responded satisfactorily to most of my initial comments. The more detailed explanation of how the migrating and non-migrating tides are extracted from satellite observations and reanalysis output is particularly welcome. However, there is one question, about the interpretation of the phase behavior displayed in Figure 12 that was not addressed in the revised paper (see below). It would be helpful to have some clarification of this issue.

Thank you very much for the favorable comments. Please see below for our answers to your specific comments.

Specific Comments (page, line):
(11, 28) "Westward (eastward) tilting waves": The statement in the text appears to imply that, somehow, westward tilting waves dominate the wave field in the western hemisphere, while eastward-tilting waves are dominant in the eastern hemisphere. As noted in my original review, this is puzzling and calls for some explanation because, if these waves are being forced by the daily cycle of convection over land, both westward and eastward waves should be excited at each center of convection. Perhaps the appearance of predominant westward (eastward) tilt in the western (eastern) hemisphere is simply an artifact of the superposition of wave trains emanating from each center of convection? In any case, some explanatory remark about how this pattern might arise would be welcome here.

We think that such asymmetry may be explained by two factors:
1) The major excitation regions are confined around -60 to +20°E (see also Sakazaki et al., 2015b); because waves are subject to dissipation during the horizontal propagation, westward waves are likely dominant to the west of -60°E and eastward waves are dominant to the east of 20°E.
2) Westward signals are clearer between -60 to +20°E, even though in this region both westward waves (from Africa) and eastward waves (from South-America) might be equally important. This asymmetry is likely because westward waves (mainly wavenumber 5) is more efficiently excited by

tropospheric heating than eastward waves (mainly wavenumber 3) (see also Fig. 15), due to the difference in their typical vertical wavelengths.

We have added these discussions in the revised manuscript (Page 11 L31- Page 12 L8).