

Atmospheric Measurement Techniques

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Statistical analyzing the effect of ionospheric irregularity on GNSS radio occultation atmospheric measurement, by Mingzhe Li and Xinan Yue

Dear editor:

Thank you very much for your handing of our paper. We have responded to the comments point by point and made revisions to the manuscript accordingly. Here we submit the response to the comments and a revised manuscript. Our point by point replies are given below. The comments are marked in italic, and revised portions are marked in blue. The line numbers of revisions are cited according to the revised manuscript.

Sincerely
Mingzhe Li

Comments to the Author:

As mentioned by Reviewer 2 you should at least mention that there are several possible sources for "bad" data, for example the sudden stratospheric warmings.

Reply: Thanks for the comment. We have mentioned the sudden stratospheric warming events effect in lines 284-291 as “The scatters in the panels are probably due to that the failed inverted RO and the bending angle oscillation are not only affected by the Es and FI but also related to other factors. For example, the sudden stratospheric warming events can make the atmospheric structure changes significantly and far from the climatology. As a result, bias between the RO observation and the climatological model could be increased and lead to the atmosphere RO event is identified as “Bad” during inversion. Considering the sudden stratospheric warming events often occur over the polar winter (Butler et al., 2015), they could also contribute to the pattern difference between the ionospheric irregularity occurrence rate and the two parameters in Figure 4. Meanwhile, the observation and inversion noise could also make contributions”.

Also, you must improve grammar in the new lines 347-352.

Reply: Thanks for the comment. It has been revised in lines 347-350 as “Overall, the ionospheric irregularity effects on GNSS atmospheric RO measurement exist. The effects can lead to the failed inverted RO event and the bending angle oscillation. A suitable filter may be effective in calibrating these effects and improving the quality of atmospheric RO products. We hope to investigate the potential calibrating method in our further work”.

We have also checked the manuscript and revised some spelling errors. Thank you very much for the helpful suggestions.