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Atmospheric Measurement Techniques Discussions

Interactive comment on "An introduction to FY3 GNOS instrument and its performace tested on ground" *by* W. Bai et al.

Anonymous Referee #3

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Report for the manuscript amt-2013-331 by W. Bai et al.

The manuscript by W. Bai et al. contains an introduction to the new Chinese GNOS RO instrument. It discusses its performance both from laboratory and mountain-based experiments and also presents a few comparisons to near-by radiosonde data. This paper is useful for the RO community in order to know about the characteristics of this new instrument.

The discussion of these preliminary results and comparisons to other data and instruments is however brief and I think the paper would benefit if this part is enlarged. I would thus encourage the authors to submit an updated paper before it can be recommended for publication.

Below is a list of some general and specific comments.

General comments:

There have been many comparisons of RO data to radiosondes. A recent such reference is: B.-R. Wang, X.-Y. Liu, and J.-K. Wang, Assessment of COSMIC radio occultation retrieval product using global radiosonde data, Atmos. Meas. Tech., 6, 1073-1083, 2013 www.atmos-meas-tech.net/6/1073/2013/ doi:10.5194/amt-6-1073-2013

Even though this is not containing mountain-based data it could be relevant for understanding the accuracy of the results presented in the manuscript. There are other papers which contains investigations of mountain-based data. I'm not so familiar with this but there is e.g. this relative recent presentation by E. Griggs et al. from the IROWG-2 Workshop: http://irowg.org/wpcms/wp-content/uploads/2013/12/IROWG2_Abstracts-43.pdf This could also be relevant. I would encourage the authors to locate other relevant references where RO data obtained from mountains were investigated.

The characteristics and performance of GNOS is discussed on pages 707-712. Here, I would like to see a more detailed discussion of how GNOS performs compared to other RO instruments, e.g. IGOR on COSMIC and GRAS on Metop. This should also include the results presented in Figs. 4-6, and how they compare to results obtained from other RO instruments already in operation.

Specific comments:

When Metop is mentioned on pp.705-706, I suggest that there should be a reference to this paper: A. von Engeln, S. Healy, C. Marquardt, Y. Andres, and F. Sancho, Validation of operational GRAS radio occultation data, Geophys. Res. Lett., Vol. 36, L17809, doi:10.1029/2009GL039968, 2009

On page 709, lines 22-24: what are the latitude and longitude of these two occultations and how close were they?

On page 712: How are these percentages for the differences calculated, at a fixed

height or over some interval?

I suggest that these numbers, and the data in Fig. 8, should also be presented as the relative differences. In Fig. 8, please show the full height interval (up to 20-25 km or where the radiosonde data ends).

The same comment applies to Fig. 9, please also show the relative difference and this relative difference for heights from 0 to 40 km.

On page 713, line 3, suggest changing the text to "...observations will provide important contributions to the global...".

Technical comments (and suggestions):

Correct "performance" in the title

Insert "the" (before FY3) in the title

Abstract, line 6: is it at 03:03? (on p. 706, line 16, it says at 03:07)

p. 705: line 6: change "to sound" to "for the sounding of"

line 19: 2500 COSMIC occultations is perhaps the maximum, so consider to write "up to 2500"

line: 25: change "is the one of" to "is one of"

line 27: write "years"

p.706: line 2: change to "Gorbunov et al., 2006"

line 11: change "add the GNSS" to "carries the GNSS"

p. 708: line 4: change to "...allows using the zero-differencing method..."

line 22: Correct the spelling of "Sokolovskiy"; and insert the year after the second reference

line 26: change to "sampling" and change "proved" to "demonstrated"

p.709: Define acronyms GEO, IGSO, MEO in the text

p. 710: line 25: change "in" to "on"

p. 711: line 5: is it 18-21 September? Note, in Fig. 7 is says 21-25 September.

line 14: insert "the partial bending.."; and insert "Healy et al....".

line 15: insert "Hu et al...".

line 16: end sentence with "was given as"

p 712: line 3: change to "...above, we succeeded...."

line 7: insert a reference to this radiosonde website

line 21: change "just" to "only"

p. 713: Change METOP to Metop.

Table 2: insert units for the Volume numbers

Figs. 2 and 3: change "in 24 h" to "in a 24 h"

Figs. 4, 5, 6: make them larger to make them more readable

p.713: In principle the last sentence where an anonymous reviewer is thanked cannot appear before the manuscript has undergone review!

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 703, 2014.