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Discussions

Interactive comment on "Comparison study of COSMIC RO dry air climatologies based on average profile inversion" *by* Julia Danzer et al.

Anonymous Referee #2

Review of "Comparison study of COSMIC RO dry air climatologies based on average profile inversion" This study applied the API method to retrieve refractivity and dry temperature climatology for COSMIC data from January to March 2011. The method is not new, but a thorough comparison against multiple data could be very interesting. However, the paper is not well organized, and the presentation cannot be followed smoothly. The structure of the paper needs to be refined. Furthermore, some results lack of insightful explanation, or have no interpretation at all. The writing is another major issue. There are many grammar mistakes and typos. To make this work publishable, the authors should consider a thorough revision.

P: page, L: line Here are some of my major concerns, âĂć The abstract could be rewritten with major points of conclusion from this study. âĂć check grammar and language

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âĂć re-structure and consider the way of presenting. For instance, the method of API may be presented immediately after the first sentence. âĂć L17. The authors use different terms, e.g., upper initialization, upper boundary value, and top. They need to be clear, precise and consistent. âĂć P2L4, is that only in UTLS? Why? âĂć P2L30, "up to high altitudes", how high is it? "introduced an alternative approach", I guess it is not an alternative approach, but a different application? Please clarify. âĂć What is the major benefit of the API method? While it is comparable to IPI below 35 km, I see it is not very helpful in extending the accuracy of retrieval above 35km. Is it computational efficient? If so, can the authors provide the computational cost of the API and IPI? âĂć "The averaging of a large number of profiles suppresses noise in the data, enabling observed bending angle data to be used up to 80 km without the need of a priori information." I do not understand. Can the authors explain more on this? which figures or results support this point and how? I did not see the connection of the current results to benefit of using bending angle data between 35 and 80 km. âĂć Definitions of M and N in Equation 3 do not seem correct. âĂć Many figures and results lack of complete explanation. I just list some of them as below, âĂć Figure 1, "only negligible implications are found". Why are the dry temperatures retrieved using different Rc identical? What does "implications" mean? What is the reason for the large differences between 2–8 km? âĂć Figure 2, please explicitly provide what the dashed straight lines are. I think impact height is more accurate than impact altitude? âĂć Figure 3, what is the reason for the greater than 0.8 % difference around tropopause in refractivity? What is the reason for the large differences in the lower atmosphere (near surface)? What does altitude mean in the y axis? Is it impact height? How is the percentage calculated? Is the difference normalized by something? âĂć Figure 4, there is no description at all. What is the purpose of putting this figure? âĂć Figure 5, what does "data show again a slight increase" mean? What increases? Again, what is the explanation for the near surface differences? âĂć Figure 9, the authors could provide more explanation for the large differences in the northern high latitudes. âĂć Figure 10, "increasing" to about +/- K is not accurate. It seems the patterns among the choices are different for the

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bins in the northern/southern hemisphere. Are the results showing here season dependent? âĂć Summary and discussion: Instead of repeating the major steps of what was already presented, the authors need to highlight the major points, and discuss the limitation and generalization of this study.

Some Minor comments (there are many more), âĂć P1L3, remove already âĂć P1L3, propagating –> propagate âĂć P1L17, what does already mean? âĂć P1L14, expansion –> extension, check all usages throughout the paper âĂć P1L19, between –> among âĂć P1L20, P13L9, average profile inversion –> API âĂć P2L2, remove meanwhile âĂć P2L5, global analyses and forecasts? âĂć P2L6, simulations might be simulation? âĂć P2L8-L9, "NWP centers will always assimilate data that are as close as possible to the original measurement; in case of RO these are atmospheric bending angles, which can be assimilated without any bias correction." What do the authors mean by will? and what does "these" mean? âĂć P2L16-L17, please check grammar, "which is still small at bending angle level, but increase through the retrieval chain." âĂć P2L24, change "Ao et al. (2012); Gleisner and Healy (2013)" to Ao et al. (2012); and Gleisner and Healy (2013). Also see P18L31. âĂć P3L1, "at WEGC and DMI," –> "at WEGC and DMI." âĂć P3L2, please rewrite "section 3 ….." âĂć P3L8, "Abel transformation" or "Abel transform"? âĂć P3L30, please correct the format of the citation. âĂć P4L3, change "(2017a)" to 2017a âĂć P4L9, change "(2017b)" to 2017b; also check P10L5 âĂć P4L11, "up to", I think "below" is easier to understand. Also check other usages. âĂć P4L23 and Figure 1, I recommend using left/right or putting (a)/(b) in the figure instead of using l.h.s./r.h.s; what are the two dashed blue curves? It seems they are not mentioned in the paper. âĂć P4L24, what do the authors mean by 5O-zonal? Please be clear and precise. âĂć CDAAC and UCAR should be used (formatted) consistently throughout the paper, e.g., P6L11, P5L11, etc. âĂć P6L12, Level L2a processing? âĂć P6L15, IPI was already introduced on P3. âĂć P6L24, please pay attention to and check the use of hence. âĂć P6L29, use full term at the first time and use abbreviation for the rest consistently. Please also check other usages. âĂć P6l30, again, what is "5o latitudinal bins"? âĂć P6l30, in –> at âĂć

P7L1-L2, remove content in brackets since they were already given in P3. âĂć P8L5, L10, please be consistent on rOPS-ex and rops-ex âĂć P8L21, what does the "RO core region of 35 km" mean? âĂć P10L14, alternative âĂć P19L4, CDACC–> CDAAC

Please also note the supplement to this comment:
https://www.atmos-meas-tech-discuss.net/amt-2018-29/amt-2018-29-RC2-supplement.pdf