

Responses to Reviewer#2

Overall comments: Review of “Quality aspects of Fengyun3 D/E radio occultation bending angle products” by Li et al. The manuscript presents an analysis of FY3 D/E bending angles through a comparison with ERA5 and MetOp observations. After applying quality control, the FY3 D/E results are found to be generally consistent with MetOp data below ~40 km. At high altitudes the FY3 D/E observations exhibit larger biases and noise. The results are clearly presented, illustrating the overall quality of the FY3 D/E data after application of quality control procedures. The overall topic is suitable for publication in AMT, and I recommend the paper for publication following revisions to address some aspects of the text that are unclear. Specific comments are provided below.

Overall responses: We thank Reviewer#2 for his/her overall comments. We have carefully addressed all the major and minor comments. Please see our responses below and also the revised manuscript. The line numbers refer to the track change version of the revised manuscript.

Major Comments:

Major comment 1. The comparisons are done against ERA5. The assimilation of RO observations in ERA5 could potentially impact the results. It is recommended that the authors clarify if the FY3 D/E data are assimilated in ERA5. The fact that the MetOp data are assimilated in ERA5 should also be stated in the text. Furthermore, the potential impact of the assimilation of these data in ERA5 on the results should be clarified in the text.

Responses to major comment 1: Thanks for this comment. In fact, we have checked that both MetOp data and FY3 data have been assimilated into ERA5. However, the impacts on our results can be minor for two reasons. First, assimilation of RO data are mostly below the middle stratosphere. However, this study mainly focus on the quality of bending angle at high altitudes (above the middle stratosphere). Secondly, due to relatively smaller number of MetOp and FY3 RO observations (compared to the overall quantity of RO profiles assimilated), their influences on the calculated ERA5 data are considered can be neglected.

Yes, in order to make this statement clearer, we have clarify this information in the data section, which can be seen from lines 309 to 312 in page 5 of the revised manuscript and also as below:

“It should be noted that both MetOp data and FY3 data have been assimilated into ERA5. However, the impacts on our results can be minor for two reasons. First, assimilation of RO data are mostly below the middle stratosphere. However, this study

mainly focus on the quality of bending angle above middle stratosphere. Secondly, due to relatively smaller number of MetOp and FY3 RO observations, their influences on the calculated ERA5 data are considered can be neglected.”

Major comment 2. In line 186, the authors state that the spikes that appear in the data “have been reduced in the latest version of Fengyun data.” It would be beneficial to include some additional details on what was changed in the data processing to address this issue.

Responses to major comment 2: Thanks for this comment. Considering this comment and also a similar comment from Reviewer#1, we have corrected the original statements into the following (please also see lines 403 to 407 of page 7 in the revised manuscript):

“A spike transition at about 25 km is observable in the error profiles of Fengyun satellites. This is primarily due to two reasons: 1) extrapolation of L2 signal at fixed 25 km; 2) fixed transition height at 25 km). Since 2025, this algorithm has been updated. First, the extrapolation height of L2 will be determined by the quality of L2 signal. Second, the fixed transition height was changed from 25 km to 15 km. By this update, the standard deviations of refractivity has been reduced by about 0.5% in this height range.”

Major comment 3. One of the conclusions based on the quality control is that MetOp bending angles have minimal quality issues, and that this is partly due to “strict internal quality control system integrated into the ROPP software” (lines 216-217 and 358). It would be useful to include additional details in terms of what is meant by this statement. Does this mean that the poor quality data were already removed in the processing?

Responses to major comment 3: Thanks for this comment. After reconsidering this statement, we think our original statement is not correct. In fact, FY3 series and MetOp data all use the ROPP software to process their RO data. Therefore, the quality control scheme should be similar. In the updated manuscript, we have deleted this statement. We have revised corresponding statements into:

“This is attributed to its high-performance receiver of MetOp satellite.”

Minor Comments:

Minor comment 1: Line 33: The statement “where the existence of can be neglected” is missing a word.

Responses to minor comment 1: Thanks for this comment. Yes, in the revised manuscript, we have revised this statement to “where the existence of water vapor can be neglected”. Please see line 38 in the revised manuscript.

Minor comment 2: Line 63: “SPIRE” should be “Spire” (it is not an acronym).

Responses to minor comment 2: Thanks. In the revised manuscript, we have corrected SPIRE to Spire.

Minor comment 3: Lines 78-79: The statement “There are current a lot of work...” should be revised as it is grammatically incorrect.

Responses to minor comment 3: Thanks. We have revised to “several works have analyzed...”

Minor comment 4: Line 94: What is “NOMEX”?

Responses to minor comment 4: Sorry for this typo. We have corrected to “ROMEX”

Minor comment 5: Lines 320 and 323: Should “K” be “%”?

Responses to minor comment 5: Thanks for pointing this out and also sorry for our typo. We have corrected to % in the updated manuscript. `

Minor comment 6: Line 348: “empirically analysis of” should be “empirical analysis of”

Responses to minor comment 5: Thanks, we have corrected to “empirical analysis of”

We thank Reviewer#2 again for his/her valuable comments to make our manuscript better.