

## Reviewer #2

90 [General] This manuscript shows the methods and approaches of intercalibration between sounders to apply for long-term data set like climate data record. However, as I mentioned initially, Authors need to improve manuscript including figures and clarify the description helping readers to understand/read easily. I recommend to fix following  
95 issues before publish the paper.

We thank the reviewer for taking time to carefully read the manuscript and make comments. We have taken all the comments into account in revising the manuscript. A brief answer to individual comments is given below and we have also included the annotated manuscript that shows the revisions.

100 [Misspell] Line 13, intercalibrated should be intercalibrated Line 195 and 329, onobard should be onboard Line 312, hyrdrological should be hydrological Line 281-282, recommend target/reference to be lower case Line 282, ax should be a only? (if a and b are slope and intercept) Line 117, horizontally should be vertically Line 118, vertically  
105 should be horizontally

All the typos are corrected and other recommendations were taken into account. Additionally we proofread the manuscript again.

[Comment] Line 17-18, it is better to show the table or description of channel, frequency, polarization and use channel number thereafter.

110 We have amended that specific section to better explain the instruments. The text now includes the frequencies for all the channels.

Figures 1 and 2 are need to improve to help readers can follow the description. Suggest separate by channel like Figure 6.

115 We made these figures again and have separated the plots by channel. Please see the revised manuscript.

Figure 3 and 5 are basically telling same story, yet prefer to see Figure 5 since it has all channels and better understanding.

We agree that there is overlap between Figures 3 and 5, however Figures 3 also shows the time series and possible changes in the differences. So respectfully we would prefer to keep both figures.

120 Line 198, please specify the temporal/spatial condition for your collocation.

The details of collocation criteria are described in Section 3. It is basically based on using area averaged values from tropical oceans and night-time polar regions.

Figures 3 and 4 are not included channel 4 and 5.

125 We didn't include Channels 4&5 because those two channels are very similar to Channel 3. We explained it in the caption to clarify why those channels are not shown

Is it Figures 6 and 9, please specify the MOA as MetOp-A somewhere. We have included this in the caption of the figures.

No the caption of Figure 6 reads as:

Analyzing the time series of observations averaged over the tropical oceans for selecting the reference satellites. NOAA-19 and MetOp-A (MOA) are intercalibrated with reference to MHS onboard NOAA-18.

130 and the caption of Figure 9 reads as:

Intercalibrated time series of AMSU-B and MHS observations. NOAA-19 and MetOp-A (MOA) are intercalibrated with reference to MHS onboard NOAA-18.

I assume NOAA-19 and MetOp-A has been doing same procedure as others using NOAA-18 as a reference instrument.

Yes that is correct! It is now described in the caption of the figures too. Please also see our answer to the previous comment.

135 Figure 6, is this both tropical and polar regions or just only tropical region?

Only tropical oceans. We also amended the caption to reflect this fact.

Figure 7, it's better show only tropic (30S-30N) and polar (75S, 75N) only and then plot your calibration coefficients line on top of them. (specify a and b as well)

140 We made the plots again and limited the data to only tropics and polar nights and have printed the coefficients on the plots.