Review of the 2nd submitted version of:

"Ice supersaturated regions: properties and validation of ERA-Interim Reanalysis with IAGOS in-situ water vapour measurements"

With the first revision the authors improved the scientific content by adding some further comparisons of the ISSR pathlengths. However, the new subsections are not very carefully written concerning the discussion of the figures and the language. I would recommend to accept the manuscript after respecting the following comments that mainly address the new sections:

Major:

1. The time series in Fig. 7 does not have an additional value without describing the different years, seasons or months. According to your text it would be sufficient to additionally plot lines for RHi=85, 90 and 95% into Fig. 6. When you want to keep Fig. 7 you should discuss the time series in more detail.

2. Related to Fig. 10 only the pathlengths gained from the measurements are discussed. You must decide if this section should include the validation of ERA or not. If not, the lines for ERA in Fig. 10 should be removed. Otherwise, ERA must be discussed as well.

3. Do you really need Fig. 12 for your argumentation? So far, table 7 provide the numbers you use in the text. Furthermore, this Fig. would only provide the median and not the mean you mostly argue with. If you want to keep the figure you should carefully discuss all features they show, including the comparison with ERA, which is again not even mentioned here (see previous comment).

Minor:

1. Figs. 2, 3 and 4 should still be improved by directly juxtaposing the box and whiskers of IAGOS and ERA, which means one shrink the two x-axes to one. Having the boxes next to each other would allow a direct and quantitative comparison of the data sets.

2. P. 10 l. 5: The contrail cirrus arrives out of the blue here. You should at least provide a reference, or even introduce the importance of ISSRs for contrails in the Intro.

3. Figs. 4 and 5: Could one hypothesize that ice clouds in ERA are produced too "early" which decreases supersaturation? You might think about a more constructive comment than "…points to a missing process…." on p. 11 line 1.

4. P. 14 l. 4/5: You should introduce the warm conveyor belt and add a reference, at least similar to the dry intrusion a few lines after.

5. Fig. 8 upper panel: It would be nice to cut the satellite image at the left and right side to focus on the region of interest.

6. Fig. 8 lower panel: Interestingly, the supersaturation is even higher in ERA compared to IAGOS for the second ISSR in this particular case! It would be very helpful to see the height of the 2pvu-line to visually assign the region where the ISSRs occur (if UT, TP or LS).

7. The caption of Fig. 9 appears preliminary.
8. The title of subsection 4.2 seems a bit weird. What do you mean by "ISSR extensions"? Please explain!

9. Fig. 11: Why don't you show a box and whisker for each season, with an additional marker where the mean is located? This would add some information about the distribution of the values, which would also be nice to be addressed in the text.

10. P. 21 l. 10 ff: I don't understand this section: "A shorter mean or median pathlength implies that ISSRs are closer to each other (D14). Therefore, in winter the conditions favour ISSRs with small distances." Wasn't the summer in your data the season with the shortest ISSR pathlengths? Something seems to be wrong, either in the citation or in the season you mentioned. Also in combination with the last sentence of this paragraph : "Therefore, not only the distance between ISSR pathlengths is shortest, but also the pathlength is largest". Wouldn't this be contradictory with the sentence written before? Please rephrase or clarify in the text.

11. The titles of chapter 4 appear inhomogeneous, or rather 4.1 too technical. My suggestions would be: 4.1. Systematic (or statistic) investigation of ISSR pathlengths; 4.2 Seasonal cycle of ISSR pathlengths and 4.3. Seasonal cycle of the distances between ISSRs.

12. Are there already ideas for the reasons of the pathlengths in the different seasons and heights? Would be great to have at least some speculations to enhance the connection of your results to the meteorology.

13. Your final phrase is not a nice end. It directs the reader's attention to ERA5 while the value of your study takes the back seat.

Additional:

1. P. 2 l. 5: "The effect of cirrus clouds are ….": Replace are with is.

2. P. 3 l. 3: "…description of processes …are…." Replace are with is.

3. P. 3 l. 26: ".., study…focuses" instead of "focus"

4. P. 10 l. 10: Write : "… with cumulative probability in Figure 5." and delete the sentence thereafter.

5. P.12 l. 10: Verb missing : "One reason might -be- the data assimilation…"

6. P. 13 l. 4 and 5: Rephrase the two sentences, they are not really clever….

7. P. 14 l. 13: remove double “in”

8. P. 14 l. 34: “…,big difference.s While…..”

9. P. 16 l. 5: Add “s” to “value”

10. P. 16 l. 8: “an original” instead of “a original”

11. P. 17 l. 7: remove double “character”

12. P. 17 l. 18: “The previous results discussed….” should mean “… we discussed…”? Results can not discuss….

13. P. 17 l. 18: The “uniqueness” IAGOS data is already mentioned on P. 14 l. 19. Please delete it here or there.

14. P. 17 l. 21: an “o” is missing in “troposphere”

15. P. 17 l. 23: “…fraction….are present…”: is instead of are

16. P. 17 l. 28: “in the summer”: delete “the”

17. P. 17 l. 31: double “..”

18. P. 18 l. 11: “…in summer an the highest…” should be “and”

19: P. 21 l. 6: add “s” to layer

20. P.21 l. 10: replace the citation by the abbreviation “D14” you introduced earlier

21. P. 21 l. 11: add “s” to suggest

22. P. 21 l. 22: missing “i” in within

23. P. 23 l. 18: capital “S” for plural in ISSRS

24. P. 23 l. 32: close parenthesis after “..31 km”