General comments to authors：

The manuscript presents a new method for obtaining continuous relative humidity distribution by integrating multiple data. And it was validated through observation data from 47 stations in China over a period of five months. The results showed good consistency between the use of synergetic algorithm and radiosonde data. The additional monthly statistical analysis and case studies have also expanded the practical application scenarios of this method. I think this manuscript can be published in the journal Atmospheric Measurement Technology. But before that, I think it is necessary to answer the following questions and make minor modifications. But before that, I think it is necessary to answer the following questions and make minor modifications.

Specific comments：

1. In the introduction section, the author discusses the previous methods of using multi-source data such as radar to study relative humidity profiles, but does not explain how these differ from the synergetic algorithm mentioned in the manuscript. Please explain specifically where the proposed methods are new? What is the difference from before?

2. The author mentioned in the introduction section (lines 69-76) that many literature studies have introduced data from Raman LiDAR and microwave radiometer to obtain continuous RH profile data, but did not elaborate on the differences between your method and theirs. This will confuse readers: where is your new method new? Please provide a supplementary description for this section.

3. In section 2.1, when it comes to Raman differential absorption and setting the signal-to-noise ratio to 3, the description is unclear.

4. In the Instrumentation section, line 118 mentions' The uncertainty of the instrument can reach a confidence level of 95.5%. '. This description is confusing.

5. In the Methods and Evaluation section, the core steps of the dynamic optimal stitching algorithm (Figure 2) mentioned, such as correction coefficient calculation and weight allocation, lack mathematical formulas or quantitative descriptions. Suggest adding specific algorithm formulas and detailed explanations in the text rather than in the figure.

6. There is a formatting issue with Table 2, please make the necessary changes.

7. I noticed that after introducing the observation results of LiDAR, the maximum correlation coefficients R of the collaborative algorithm in HHHT, YB, and QY were 0.90, 0.91, and 0.93, respectively, which is very good. However, the RMSE of each instrument's individual data and sounding data exceeds 20% (Table 3). Does this indicate poor reliability of the data? What do you think about this?

8. At the end of section 4.1, the author analyzed the sources of errors. There are many sources of error analysis that lead to data uncertainty, such as the consistency of observation equipment? What is the uncertainty caused by regional differences? What is the physical essence that leads to differences here? There are many things worth pondering, which is why I recommend publishing this manuscript. It is meaningless to simply analyze these data differences.

9. The case analysis relies on ERA5 reanalysis data to provide the weather circulation situation (Figure 7), and the results generated by the synergetic method with Figure 8 lack correlation explanation. This is very confusing.

10. The conclusion section is cumbersome and not concise, please rephrase.