

Atmos. Meas. Tech. Discuss., referee comment RC1
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Comment on amt-2021-118

Anonymous Referee #1

Referee comment on "Evaluation of retrieval methods for planetary boundary layer height based on radiosonde data" by Hui Li et al., Atmos. Meas. Tech. Discuss.,
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Comments on the manuscript entitled " Evaluation of retrieval methods for planetary boundary layer height based on radiosonde data" by Li et al., submitted to Atmospheric Measurement Techniques (AMT-2021-118):

The manuscript described and inter-compared performances of four methods (PM, RM, GM_{RH} , and GM_{θ}) which were widely used to estimate PBLH from RS data. In general, the study fit the scope of the journal and the manuscript was well organized. These results shown in the manuscript can be regarded as a useful reference when selecting boundary layer algorithms. Additionally, there are still several points that need to be clarified before it could be considered for acceptance.

Specific comments:

- 1) In Abstract section, some sentences are not clear enough between Line 19 and Line 25 of Page 1, such as "PBLH from PM is the lowest under all and SBL classifications, and the highest under CBL and NBL classifications". Please rephrase or clarify.
- 2) The study focused on estimating the performances of four PBLH calculation methods. But, in the Introduction section, the description of the advance of the subject (namely, the various comparison and estimation of PBLH methods in existing research) is not sufficient enough.
- 3) How much data were used in the study obtained from sites of Beijing, Wuhan, Changsha at 0600 UTC? Since the 0600 UTC is afternoon at local, there should be more CBL and NBL cases in these three cities (as shown in Figure 1 and Page 6 Line 1-2).

4) In addition to the TIL, have any additional indicators been added to filter data in order to remove cases under extreme weather conditions? Will the extreme weather, such as rain, snow, fog and storms, impact on the estimation of the boundary layer for RS data?

5) Whether the performance estimations and the OP method are affected by geographic location? I noticed that the mean value of PBLH obtained by OP method are lowest or nearly lowest among the four methods in some cities, such as 57494, 57687, 59758, and 59948.

6) It is better to add a flow chart for the OP method as described in section of 3.4.