

Atmos. Meas. Tech. Discuss., referee comment RC2
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Reply on RC1

Anonymous Referee #2

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):

This study focuses on the performance of four common RS methods under different thermodynamic stability conditions and proposes an optimal processing flow for the RS data retrieval of PBLH. This study provides an optimal RS standard value retrieval method for further inversion of the PBLH through artificial intelligence algorithms. The article has a clear structure and contributes to this area. But in my opinion, there are still some problems should be solved before publishing.

Major concerns:

For gradient method, the author mentioned that the threshold values of the potential temperature and RH vertical gradients were set as 0.003 K/m and 0/m, respectively. Why need to set this threshold? Similarly, why was the threshold of Ri set to 0.25, and whether

the sensitivity test has been carried out?

About the RS data, why did author choose only nine sites for the experiment? Will there be similar results using data from all sites in the country?

Specific concerns:

Section 1: In the third part of the introduction, only a few methods compared in this paper are described in the description of the existing RS data retrieval methods of PBLH, which should be described more comprehensively.

P4-L18-19: This article studies PBLH retrieval method based on RS data. What is the role of radar wind profiler here?

P6-L6: Although there is an explanation for the abbreviation of GM_θ in the abstract, what does the θ refers to here, should be explained again.

P6-L19: Does the "rib" here refer to the Richardson number? If so, "b" should be in the form of subscript. And the specific meaning of ri_b needs to be explained.

Figure 2: Why is the proportion of various categories not 100% at All time? At different times, the proportion of different categories is relative to all the cases of a site, or relative to the effective cases?

Section 3.3: This section analyzes the consistency of different algorithms under various classification conditions, and finds out the reasons for the inconsistency. However, we notice that the inconsistency ratio under SBL classification is higher than that under other classification conditions. It is suggested to make a key explanation for the high inconsistency ratio under SBL classification.