

This manuscript presents the method for determining the MLH using the dissipation rate of turbulent energy estimated from scanning lidar measurements. The application and accuracy of the method are demonstrated in an experiment in which the wind velocity turbulence was estimated in smog conditions due to forest fires in Siberia in 2019. The results are also validated by comparing to that retrieved from the radial velocity variance and the Richardson number.

The method is useful in mixing layer research. The accuracy of the method is discussed and the analysis is careful. The manuscript is recommended to be published on AMT after major revision, as below:

1. In Sec.3, The details of the turbulence energy dissipation rate could be more briefly.
2. In page 6 line19. The turbulence intensity decreases during 14:00-16:00, as show in Fig. 2 and Fig. 3. The corresponding MLH is obvious low during this period, as show Fig. 6. This may be caused by temperature or the cloud out of detection of lidar. I would recommend removing “On this day, there were no clouds” or add a discussion.
3. In page 14, line 26. I would suggest pasting the details of the corresponding cases, such as SNR, vertical profiles and turbulence intensity, in Appendix. The result of 35.3° is recommended to extend to 1.8 km with data quality control.
4. In page 7, line 4 and line 11. “Figs. 2(a) and 2(b)” should be “Figs. 2a and 2b”, to keep the format consistent.
5. The journal title abbreviation should be checked, such as in page 17 line 18,” Opt. Expr.”, in page 16 line 25, ”Boundary-Layer Meteorol”.
6. Page 1, line 23. “radioacoustic” should be “radio acoustic”.
7. Page 3, line 28. “depend” should be “depends”.
8. Page 14, line 20-22. Page 15, line 4-7. The descriptions are repetitive.
9. Page 18-20, figure 1-3. The results are both on July 21 of 2019. Suggest plotting in one figure for finding some relationships.
10. Page 25-26, figure 8-9. The two cases are partly cloudy as well as figure 7. Some descriptions about the three cases are repetitive. Also, the two cases are not used for analyzing the relative error of the MLH. What role of the two cases in this manuscript? I would suggest moving to the Appendix.
11. Page 31-32, figure 14-15. The results are both on May 1 of 2020. Suggest plotting in one figure for intercomparing. The data between 800-1000m seems noisy. Do you have data quality control of the raw data? Which line represents the MLH retrieved from the Richardson number in figure 15?