General comments

The manuscript has been improved to some extent after two revisions. However, several important reviewers’ comments are not well addressed. Some responses like *“… but there is not enough time for professional language editing services and we will make further improvement with professional language editing*” are not acceptable (see response 5 on Page 4 in coverletter.387157.v3.pdf). Please carefully address all the comments that reviewers provide and make sure that the manuscript is readable and understandable. Especially, please avoid using any long and complex sentences if you are not good at that. Significant English writing improvements are required before the manuscript is accepted for publication.

Specific comments:

1. The abstract can be rewritten as “Accurate identification of key parameters for data assimilation is important to simulate the planetary boundary layer height (PBLH) and structure evolution in numerical weather prediction models. In this study, surface observational data and lidar-derived PBLH on 42 cloudless days from June 2007 to May 2008 are used to quantify the statistical relationships between surface parameters and the PBLH at a semi-arid climate observational site in Northwest China. The results indicate that surface upward long wave radiation, surface temperature, and surface sensible heat fluxes show strong correlations with the PBLH with correlation coefficients at a range of 0.63-0.72. But these parameters show varying correlation response time to the different stages of PBL development. Furthermore, the air temperature shows the highest correlation with the PBLH near the surface and the correlation decreases with increasing height.”
2. Please rewrite the following sentences by using short, concise, and readable sentences. They include the sentences at Lines 60-62, Lines 62-65, Lines 74-75, Lines 81-83, Lines 89-93, Lines 93-95, Lines 97-99, Lines 103-106, Lines 108-113, Lines 114-116, Lines 171-176, Lines 185-187, Lines 204-206, Lines 219-222, Lines L239-245, Lines 245-250, Lines 261-264, Lines 266-270, Lines 270-273, Lines 273-276, Lines 293-297, Lines 301-304, Lines 304-308, Lines 312-314, Lines 315-318, L320-322,

Lines 322-326, Line 330-335, 339-344, 368-373, 378-383, and Lines 407-410.

1. L68: “Vertical distribution of air temperature” and “atmospheric stability” talk about the same thing. Please delete one of them.
2. Lines 68-73: You discuss the boundary layer height (BLH) in most places in the manuscript. However, you discuss “the mixed layer height” here and mention “planetary boundary layer” in the title. It is better to use the same terminology.
3. Line 74: add “and” before “many studies”.
4. Line 78” “and because of its high temporal and spatial resolution” 🡪 “for both temporal and spatial resolutions”.
5. Lines 95-96: It will be better if the sentence is rewritten as a simple one. It is recommended to use the same tense in one sentence (either present or past). Please check similar issues thorough the paper.
6. Lines 97-98: The statement of “the boundary layer is categorized into the atmospheric thermal boundary layer and the neutral boundary layer” seems inaccurate. Please double check.
7. Lines 102-103: The statement is not correct, please rewrite this sentence.
8. Lines 139: “The main instruments providing the data” 🡪 “The instruments”
9. Lines 146-147: Please rewrite the sentence of “The lidar …. 30 min”,
10. Lines 148-149: Please rewrite the sentence of “Leve 1.0 … 10 km”.
11. Lines 149-151: Please rewrite the sentence.
12. Lines 151-152: Please rewrite the sentence.
13. Line 157: What is erf? Please equation number like (1) at end of the line.
14. Lines 160-161: The definition of entrain layer is not correct.
15. Line 163: What are the two profiles?
16. Lines 164-166: The sentence is very confused. Please rewrite it. Bm has been defined at Line 158.
17. Lines 166-168: The sentence needs to be rewritten.
18. Lines 192-194: Abbreviations of all the variables do not follow conventional standards. For example, “surface air temperature” usually uses “T0” or “Ts” rather than “SAT”. Please correct the same abbreviation issues in all other places of the manuscript.
19. Lines 195-196: You can mention the significance test levels for different correlation coefficients in the text, but it is not necessary to list the significance level numbers in Table 2.
20. Line 219: Please add “, respectively” after 0.677.
21. Lines 224-228: Please be careful to use “;” when it is not necessary.
22. Tables 3 and 4: Please correct the same issues as pointed out for Table 2.
23. Lines 236-238: Please rewrite the sentence as “Table 4 shows the statistical correlation coefficients between ….”.
24. Line 266: What do you mean “the inherent disadvantage of the method”? “Figure … shows” 🡪 “Figures … show”.
25. Lines 274: “exited on” 🡪 “existed at”
26. Lines 297: “obviously” 🡪 “obvious”
27. Lines 293, 295, 309, 316, 327: DSR, USR, ULR, DLR, NR do not follow the abbreviation standards.
28. Line 305: “exited on” 🡪 “existed at”.
29. Line 314: “The times that the peaks occurred were” 🡪 “The peak values occurred”.
30. Lines 336-337: SAT, ST, SHF, and WS do not need redefine here. Again these abbreviation terms are not standard.
31. L337-339: This statement is useless or rubbish.
32. L352: heat sensible –> sensible heat
33. L354: Again, do not redefine abbreviation. Please correct the similar issues in other places.
34. L361-363: It is common sense.
35. Line 369: “exited on” 🡪 “existed at”
36. L373-375: Rewrite the sentence.