

**General comments to authors:**

The authors proposed a synergistic algorithm based on five months of observation data in China. And through application research and case analysis on different sites, we have seen the application prospects of this method, which I think is a very interesting study. However, before publication, I feel that there are still some areas that can be slightly revised and improved.

**Specific comments:**

1. Throughout the manuscript, 'lidar' should be 'LiDAR'.
2. The language expression of the authors needs minor revisions, especially in the introduction section where there are too many long sentences, which can confuse and obscure readers.
3. Some abbreviations that first appear in the manuscript require brief explanations, such as 'SAPHIR', 'MEGHA-TROPIQUES', 'LST', etc.
4. Why are the data samples from three different sites in different regions of China not consistent in Table 3 (3771, 7542, 8110, respectively). Is there any special significance to this? If not, is the sample data consistent and comparable? If not, is the result convincing?
5. To enhance visual harmony, we recommend unifying the dimensions of the subfigures in Figures 6 and 7.
6. The authors re-selected the case analysis, but it was not reflected in the final conclusion section. Additionally, the abstract is not concise enough, and I believe it is necessary to rephrase it.