Earth Syst. Sci. Data Discuss., referee comment RC2
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Comment on essd-2020-406

Anonymous Referee #2

Referee comment on "Turbulence dissipation rate estimated from lidar observations during the LAPSE-RATE field campaign" by Miguel Sanchez Gomez et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2020-406-RC2, 2021

This is likely to be a valuable addition to the data corpus of environmental turbulence measurements. I have two general recommendations, one superficial the second of more concern.

(1) Minor. The Introduction and in part the summary both refer to the field campaign being part of LAPSE-RATE which was focused on remotely piloted aircraft (RPA). The implication is that paper uses data from instruments on RPA platfroms. AS far as I can see, this may be a later intention, but for this paper it is not relevant.

(2). Major. The paper decribes and compares two lidar systems, both used to estimate turbulent dissiaption. A reader coming to this paper and data set would wish to know (a) Are the instrument systems actually fit for purpose to do this, and (b) are these data useful. This is not possible to judge because there is no indication of error analysis or displays of confidence limits or other typical presentations when measurement sets (whether instrument or model output) are compared.

Figures 2 and 3 are noteworth here: as far as I can see, figure 2 is smoothing of a noisy curve (using limted splines), whist figure 3 is fitting a Butterworth-style transfer with pre-defined cutoff (-5/3). There is no knowledge gained from these. I recommend some estimate (with error) of say the displation decay, and whether it agrees or not with Kolmagorov. Only when we have these statistical results can the quality and benefit of these data and methods be assessed by the reader.

NB I have ticked POOR for Usefulness, Completeness and Data Quality: this should rather read 'not proven' but that tick box is not available.