Dear Dr. Bierbooms,

Thank you very much for your opinion on the manuscript and for your detailed comments that are very helpful and appreciated.
Herewith our response to your comments in red: XXX--- the response ---XXX

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This is an excellent paper on measuring turbulence with a lidar. I have just a few remarks in order to improve the readability.

The division of section 2 in just one subsection, 2.1, is rather odd and can be omitted.

XXX--- We agree with you. Now there is no subdivision of the section and has been shortened ---XXX

The direction of the lines in Figure 1 should be clearly indicated, e.g. by adding a plane and/or a front view. The different colours should be mentioned in the caption.

XXX--- The figure is now changed as suggested and the caption contains now details on the colors ---XXX

Page 6, line 4: "This is expected .." It can be explained in more detail why this is.

XXX--- We now provide a further explanation of this and also give an additional reference ---XXX

Page 9, Figure 4: in order to avoid confusion with figure 4a other colours should be used in figure 4b; furthermore z_R/L=0 should be added (in the caption)

XXX--- Figure is changed as suggested and the suggested text is added to the caption ---XXX

Page 13, line 15: explain the figure-of-eight

XXX--- We expanded the explanation regarding the figure-of-eight ---XXX

Page 14, mention in the caption of Figure 7 (left) why beam 3 is omitted.

XXX--- Text is now added to the caption as suggested ---XXX

Page 18, first sentence: explain "lidar-effective velocity"

XXX--- The text was indeed unnecessary and so it is now removed ---XXX

Page 19: explain (e.g. in an appendix) the normalized Doppler radial velocity spectrum. Furthermore, it is unclear to me how the variance can be estimated after normalisation (line 6, page 19)

Page 22, last complete sentence: it is not clear to me why the ratio is underpredicted; in Fig. 4a I notice a ratio of about 0.82 (red dashed line); in fig 14 b a slope of 0.87 is indicated in the fitted red line (Mann-based), so an overprediction.

Typo's etc. Caption Figure 4: Change "divided by the lidar… " into "divided by the variance of the lidar…"

Page 17, line 11: the reference to Fig 5-left is wrong

Page 17, line 17; the frequencies should be 0.04 and 0.07 Hz.

Page 20, line 15: change into:"…and the sonic-derived u_star to compute L_O and phi_m values"

Page 24, line 31/32 change into: "we make use of"

Page 31, figure 21 right: probably a wrong colour is used for PHI_vw; it should be light blue (instead of black)

There is something peculiar with figure 14: in the left figure 2 data points are visible in the column for sig^2_cup between 6 and 8 m^2/s^2; and 2 data points in the column between 8 and 10. In the right figure it are 4 and 2 data points resp. (In Fig 15 left it are resp 4 and 3 data points and in 15 right 4 and 3

XXX--- Thanks for pointing to this very specific issue as well! In Fig. 14-left, 2 points were just above 10 m2/s2 within the 6—8 m2/s2 bin and 1 within 8—10 m2/s2. The third point within the 8—10 m2/s2 bin in Fig. 14-right is well above 11 m2/s2 together with another point on a lower bin so that it is more complicated to locate (we clarify this in the caption) ---XXX