Dear Anonymous Referee,

thank you for reviewing our paper draft, your positive feedback and all the thoughtful and helpful comments.

In the following we try to answer your questions and consider your remarks. Comments of the referee are in **bold font**, replies are given in regular font and our adaptions in the letter are shown. Proposed changes in the text of the paper are marked by *italic font*. Added content is highlighted by *blue and underlined* and deleted content by ~~red and crossed out~~.

Yours sincerely,

Lars Neuhaus (on behalf of all authors)

This paper presents a study to investigate the Turbulent/Non-turbulent interface in the atmosphere using measurements from met masts and lidars on two offshore and one onshore windsite. Existence of the TNTI interface and its probability distribution with height as well as its fractal scaling is studied. The paper is well written in general.

Thank you for your positive feedback. We will answer your questions in the chronologic order.

Use of English language needs improvement as to some expressions and descriptions sound strange. Some comments are below:

We are sorry, that the first version was not as good as we had hoped. We have made an effort to identify poorly worded expressions and improve the language. All changes can be found in the 'diff file'.

In Section 4.1, authors mention that strong influence of measurements techniques are expected but they indicate that this is out of scope for this study. I understand that but I think the authors should elaborate somewhat more since these differences may influence the results presented in this paper. The anemometers sample at 1 Hz and 2 Hz sampling rates but the Lidars provide temporal data with a resolution at every 17 or 18 s. So there is a big differ-

ence in sampling rates. Please provide some comments regarding the effects of these big differences on presented results.

Thank you for your hint. We removed the misleading comment and now explain the effect of the different sampling frequencies.

Page 10, lines 172 – 173:
Figure 8 shows the resulting probability density functions (PDF) for the individual sites. All sites show an increase of low turbulence intensity ~~events~~ sections with height. ~~For $TI < 1\%$ the results seem to get physical unreasonable. Here also strong influences of the measurement techniques are expected. However, this is not of relevance for the analysis in this paper and hence not further discussed.~~

Page 17, lines 252 – 257:
Differences are observed at different measurement locations and for different measurement techniques, including temporal resolution, spatial resolution, and observed periods. The resolution of the measurement is important to get proper values. As the fractality describes the self similarity on different scales, the temporal (or spatial) resolution defines the lower bound until which fractal features can be seen. While the met masts give information on the small scales (below the rotor diameter), the lidar data sets only give information on larger scales. For the investigated frequencies a robust behavior of the fractality is observed. [...]

In Figure 8c, the data shows very wide pdf distributions at low heights unlike other Cabauw data. Authors allude that this could be due to differences in measurement methods. Please elaborate. Why are there significant characteristic differences in pdf distributions between the metmast data and the Lidar data at Cabauw?

All data is from different measurement campaigns (see Sec. 2 of the manuscript) and based most likely on different meteorological conditions. We are now clarifying this in the manuscript.

Page 10, lines 178 – 180:
[...] However, a direct comparison is difficult due to the different measurement methods, the different measurement periods and seasons. Thus these statistics are based on different meteorological conditions which were selected..

In Figure 8a the color scale is poorly chosen. It's hard to distinguish 100 m and 33 m data for example.

We are sorry for this inconvenience. The problem we have is that we chose a color scheme that we used for all results to show them consistently. Since we intend to show with this figure a common PDF for all heights, we think the message is still delivered despite the problem of seeing the difference between 100m and 33m. In addition, quantified details are given in Fig. 9. We now mention this in the caption of Fig. 8. To remain consistent, we would like to leave this figure unchanged.

If the referee is not satisfied with our response, we offer to include individual figures per height in the appendix.

Page 11:
Figure 8. *Probability density functions (PDF) of the turbulence intensity at different heights for the data sets FINO1 (a), Cabauw (b), Cabauw Lidar ZP (c), Cabauw Lidar ZX (d), and Borssele (e). For a further quantification, see Fig. 9.*

Page 13:
Figure 10. *Probability density function of the fractal dimension D_f conditioned on the different TI ranges: $TI < 2.5\%$ (a), $2.5\% < TI < 7.5\%$ (b), and $TI > 7.5\%$ (c). The red dashed line indicates the typical TNTI fractal dimension of 0.36 and the shaded red area a range of ± 0.036 around this value. The normalization of the PDFs is done based on all sections including invalid fractal dimensions ($S_r > 0.02$), which are not shown but would correspond to a peak at "NaN". For a further quantification, see Fig. 11 (a).*

Page 16:
Figure 12. *Probability density function (normalization according to Fig. 10) of the fractal dimension D_f conditioned on the TI range $2.5\% < TI < 7.5\%$ for FINO1 (a), Cabauw (b), Cabauw Lidar ZP (c), Cabauw Lidar ZX (d), and Borssele (e). The red dashed line indicates the typical TNTI fractal dimension of 0.36 and the shaded red area a range of ± 0.036 (gray area ± 0.1) around this value. For a further quantification, see Fig. 13.*

Thank you very much for your efforts and your thoughtful comments,

Lars Neuhaus (on behalf of all authors)