In this document, the reviewer's comments are in black, the authors' responses are in red.

The authors thank the reviewer for their thoughtful and productive comments.

The paper analyses wind and turbulence measurement data obtained from in-situ and remote sensing instrumentation during the WFIP2 campaign in the Columbia River Gorge in the North-West of the USA. It aims at describing the dissipation rate of the turbulence kinetic energy of the flow in orographically complex terrain at various spatial and temporal scales and under different thermal stratification. The authors refer to the need of a better description and parametrization of turbulence, esp. turbulence dissipation rate, in numerical weather forecast models of different resolutions, and hope that their analysis can provide some insight into the characteristics of turbulence in complex terrain and help the modellers to parameterise it better in their codes.

The paper is well written and good to understand for readers familiar with the subject. For example, when reading the manuscript, several times I had a question which was soon getting answered later in the text! Very comfortable! Although their qualitative findings (e.g. the patchiness/intermittency of turbulence) are neither new nor surprising, the authors provide a thorough and helpful quantitative analysis. I recommend publication of the paper after the authors have commented on my few points / questions in order make the paper even more comprehensive and complete:

Thank you for finding our paper interesting and easy to read!

P. 7: the importance of the choice of the sampling size N is correctly emphasized. Could you mention typical (and extreme) example sizes for LN in your data set? So, what are the dimensions of the turbulence inertial subrange? The end is given in Fig.2 but where does it typically start? At f = 0.01 Hz, as Fig.2 possibly suggests?
We have added the following sentence to the description of the method: "The distribution of sample size values we obtain is between 20s (5th percentile) and 300s (95th percentile)." In Figure 2, we have also added a vertical line to the figure to identify the maximum of the local regression, and we have changed the caption of the figure accordingly.

P.12, Table 3: Why don't you include the neutral flow conditions? And how frequent do the three stratification classes occur? In other words, how large is the sampling size for your statistics?
Neutral conditions occurred less than 7% of the time. As such, we do not think they represent a sample large enough to introduce a separate category. We have now specified the % of cases which showed neutral stratification in Section 2.1.

P.12 bottom and P.13, Fig. 5 and P.14, line 3, and P. 20 lines 7-9 : It did not get clear to me which differences in topography between the "west" and the "east" parts of the "Physics Site" may cause the biased distribution in the mean dissipation rates shown in the figure. Could you provide some more details here ? Or maybe there are other causes for that? The sample sizes should be large enough to not account for that (then arbitrary) bias, shouldn't it?
Thank you for this comment – please see our answer to the next comment.

P.13, Fig. 5: In my view even more striking than the bias is the difference in the tails of the distribution of the mean dissipation rates displayed in the figure: in about 1% of the cases <εeast>

is between 2.5 and 3.0 times larger than <εwest>; whereas <εwest> is at least 10 times larger than <εeast> in 5% of the cases (or at least 5 times larger in 8.5% of the cases). So the tails are in line with the bias: there are more frequent and stronger turbulence "outbreaks" in the western domain compared to the eastern domain. Why? What causes this strong difference in intermittency? Is there a topographic feature which could create some coherency (structure) in the turbulence in the western domain which is absent in the eastern part for the prevailing westerly winds?

Yes, we agree that the data suggests that the local topography is a prime cause of this intermittency. Thank you for pointing out that we should have described the topography of the Physics Site in more detail as follows:

- We have added the following sentences to the description of the division of the five meteorological towers in two sub-groups in Section 3.1: "An analysis of the topography of the region reveals two distinct sets of terrain characteristics. The terrain to the west of the sub-group of towers on the western side of the Physics Site (towers P03 and P09) has slopes that reach 60%, and the average slopes larger than 6%. On the contrary, the remaining towers east of this cluster, which we will refer to as "eastern" (towers P04, P05, and P10), are surrounded by a terrain with more gentle slopes, which are on average less than 6% and never exceed 25%."
- We have also made this point more explicit later in the Section: "The presence of steep topography increases the variability of turbulence dissipation rate even at small spatial scales".
- We have also modified a sentence in the Conclusions as follows: "Systematic differences emerged in ε measured on the western and eastern sides of the Physics Site, the former being located downwind of terrain with larger slopes compared to the latter, thus suggesting the possible impact of terrain slope in triggering the variability of ε."
- Finally, we have added 10-m elevation contour lines to the detailed map of the Physics Site in Figure 1: