

Reply to the comments by Referee #2

S. Risius, H. Xu, F. Di Lorenzo, H. Xi, H. Siebert, R. A. Shaw, E. Bodenschatz

(Dated: June 11, 2015)

We thank Referee 2 for his/her review of our work. We are very encouraged to see that Referee 2 finds “The paper is very well written and reports on interesting measurements on the Zugspitze. Overall the paper is nice and not much has to be added.”

Below are our responses to the two specific points suggested by Referee 2 to improve our manuscript.

1. **The referee writes:** *For Fig 4 the authors write: “... different for wind from the west and from the east, which is most likely due to the different topography on the two sides”. This could be quantified by estimation the shape parameter of Weibull distribution. I expect values below 2 as the terrain is quite complex. This is a standard method, easy to be done.*

The authors reply: We thank the referee for this interesting suggestion. The wind speed PDFs fit well to Weibull distributions. In Figure 1 of this document, we show the PDFs of winds from the east and from the west, with clouds, together with the fitted Weibull distribution. The shape parameters of the fitted Weibull distribution are 1.50, 1.48, 1.33 and 1.33 for wind from the east with clouds, wind from the east without clouds, wind from the west with clouds, and wind from the west without clouds, respectively. As expected, the shape parameter depends only on whether the wind is from the east or from the west, and is not sensitive to whether there are clouds or not.

As expected by the referee, in all cases the shape parameter is smaller than 2, which signals a wide distribution of wind speed. The shape parameters for wind from the east is slightly larger, which is consistent with the local topology, i.e., winds from the east are coming from the valley, with less influence by the mountain, while winds from the west are coming over the ridge, from the wind hole and moves along the mountain before reaching the measurement site.

We reported these values and added a short discussion in the revised manuscript.

2. **The referee writes:** *For the power spectra it would be nice the show also the log derivative to show the local scaling exponents. A feature of general interest to see which other scaling are there.*

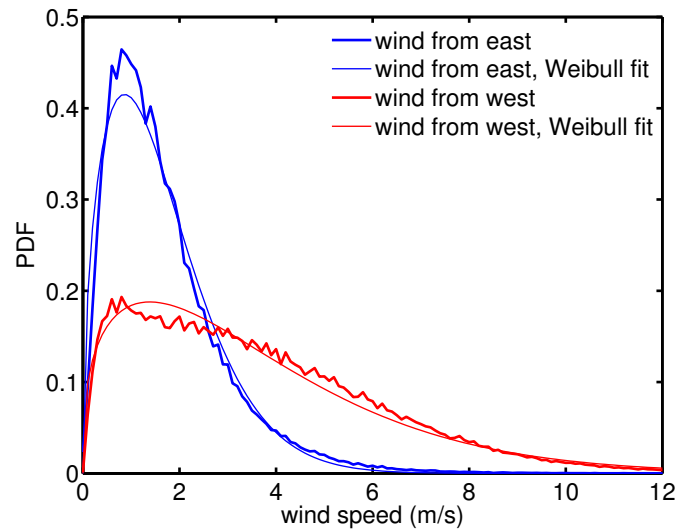


FIG. 1: The PDFs of wind speed for wind from the east and west, with clouds, together with the fitted Weibull distribution. For wind from the east, the fitted Weibull distribution has a shape parameter of 1.50 and a scale parameter of 1.80 m/s, and the corresponding parameters for wind from the west are 1.33 and 3.91 m/s, respectively.

The authors reply: We thank the referee for the suggestion. We added a plot of the so-called “local-slope” as the inset to Figure 8 (now Figure 8a) in the manuscript and changed the original inset of Figure 8, the compensated spectrum, as the new Figure 8b.