

Atmos. Meas. Tech. Discuss., referee comment RC1  
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## Comment on amt-2021-375

Anonymous Referee #2

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Referee comment on "Estimating vertical wind power density using tower observation and empirical models over varied desert steppe terrain in northern China" by Shaohui Zhou et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-375-RC1>, 2021

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This study compared three wind speed distributions of kernel, Weibull, and Rayleigh model to estimate vertical average wind power density by using meteorological tower data over varied desert steppe terrain. The topic is very interesting and has important implications for accurate and reliable wind energy evaluation. This study has the potential to provide new insights about three key parameters ( $c$ ,  $k$ , and  $z_0$ ) should be dynamically considered for estimating wind energy resources under varied desert steppe terrain contexts. The manuscript is written clearly and organized. While I found some minor issues need to be addressed. My recommendation is to accept with minor revision.

- Lines 115,117,... and figure 2 ,what are the height for daily average temperature and relative humidity ? please clarify them in the main text and figure captions
- Why did you give the shading in tables 1 and 2, any information or implications?
- Please accordingly revise all the x-axis titles, for instance in figure 4a, it is should be that WS70 (ms-1) during Autumn in 2018
- What is the unit of legend in figure 5?
- It is unclear for right y x-axis title, confused.
- Lines 193-194: by quoting the kernel function distribution close to the actual distribution as a reference, two specified distribution functions are being compared with the kernel function to find out which one can better predict the wind speed data in the area. This sentence should be rephrased, for example of "---close to the actual distribution—" , can you give some comparison results with actual measurements?
- An individual discussion section should be strengthen and added, especially for comparing the present result with others, and uncertainty for your results. Please reorganize the present section 3 and extract discussion parts, for example, Lines 185-194 should be moved to discussion section.
- Please supply the different results between figure 9a and 9b for better showing the differences at different seasonal and heights, and then discuss their potential cause.