# General Comments

The manuscript addresses a topic of great relevance for the wind energy community by evaluation of the feasibility of spinner anemometer measurements for the measurement of wind turbine power curves. Moreover, the question of using multiple spinner anemometers without requiring individual measurements of a transfer function against a met mast are of practical relevance. The choice of the annual energy production calculated based on the measured power curves constitutes a reasonable measure for the usability and it is methodically sound. The results indicate an excellent agreement of the measured (and corrected) power curves obtained for two adjacent wind turbines at a flat terrain site.
However, the calibration and correction methods used for the spinner anemometer calibration and the derivation of the nacelle transfer function are only sparsely explained and the reader is not provided with all information to follow the procedure without additional reading or in-depth knowledge of the particular spinner anemometer. This concerns particularly the spinner anemometer calibration and data conversion.
Moreover, the conclusion, that the spinner anemometer may perform equally well in complex terrain, is drawn. This hypothesis needs additional commenting and arguments to support it, since the presented study did not incorporated any effects of turbulence intensity or wind veer on the NPC. 

# Specific Comments

### 1. Introduction

- The "list of objectives" (p.2, line 5ff) is rather a list of steps performed to achieve the goal of comparing the measuring techniques and the presented correction scheme. 

### 3. Spinner anemometer calibration

- The calibration of the spinner anemometer is described only very sparsely. It is impossible to understand the procedure without briefly explaining the "$k_\alpha$ calibration" and "$k_1$ calibration" and distinguish them from the wind tunnel calibration coefficients. Although some references are given, at least an equation of the calibration should be presented to enable the reader to follow the calibration. 
- It is not explained, why the wind tunnel calibration was not introduced in the conversion box as demanded by the authors. The difference between $\Phi_s$ and $\Phi$ remains unclear as well as the reason why the path angle of the calibration is not used. What is the benefit of describing something, that was not done?  
- Which meaning or use have the averaged slope, offset and angle given in Table 1? 
- The authors do not define, what they consider "good wind conditions" (p.5, line 3). 

**4. Measurement database, data filtering and corrections**

- Is the wind direction condition based on 10-min averages (p.7, line 2)?
- Could you explain, why the four outliers were excluded (p.7, line 6ff) although it deviates from the IEC standard?
- Regarding the calibration coefficients (slope m, offset q) of the two sets of sonic sensors, the authors state, that the sensor on T5 has higher wind speed readings due to the smaller slope and smaller offset. This appears illogic, since both sensors should read the correct reference wind speed, when their respective calibration coefficients from the and tunnel are applied. If the authors are referring to the uncorrected, uncalibrated sonic anemometer signals as e.g. $U_{5,original}$, they should point this out. In this case, they should explain, why they do not simply use the calibration coefficients obtained in the wind tunnel calibration. Besides this, neither $U_5$ nor $U_{5,original}$ are defined.
- The normalization of the wind speeds is based on an unknown reference wind speed (p.7, line 15f). It should be clarified, if this wind speed is the same for all presented results.
- The quantities in Eq.(4) are neither introduced in the text nor in the list of used symbols. In general, the readability of the manuscript would be greatly enhanced, if the symbols would be introduced in the text upon first use instead of relying on the list of symbols only. At least a reference to the list of symbols in the Appendix is required in the introduction of the manuscript.
- The used abbreviations for the power P4, P4n etc. in Figure 5 are not introduced and not defined in the Appendix. Label consistency should be checked.

**5. Nacelle Transfer function measurement**

- A definition of the different wind speeds used from the spinner anemometer would improve the description of the compared quantities. What is the relation between $U_{5,original}$, $U_5$, $U_{hor}$ and $U_{free}$? Which corrections and factors are included?
- What is the reason for not using the air density correction in the NTF (p.9, line 1f)?
- From Figure 6, one can only conclude, that the claimed proportionality factor is 1 for wind speeds higher than the wind speed normalized to (which is not know).

**6. NTF self consistency check**

- Technically, the NPC fails the test at approx. 0.7 $U_{mm}$ in figure 7. A comment on this would be good. Labels need to be checked. The legend for the blue and red thresholds is cryptic.

**7. Application of the NTF**

- The first line of the Section repeats the last paragraph of the previous one.
- A reference to 1.2*rated wind speed as a condition for a match between spinner and met mast wind speed is given in p.11, line 13ff. It has not been mentioned before and if this is the condition used to select the wind speed for normalization, it should be noted.

**8. Power curves and AEP**

- Using the introduced variables could help to distinguish between the calculated and measured free wind speed referred to in p.12, line 1.
- Eqs. (5) and (6) are redundant. A general formulation of the air density correction is preferable.

**9. Uncertainty analysis**

- No reference is given for the "spinner anemometer conversion algorithm" on which the uncertainty of the horizontal wind speed is based.
- In Eq. (8) quantities a+ and a- are not defined and used for different meanings later on. Values of the used quantities are usually not inserted into the equations, but only the result is given.
- The combined uncertainty stated in Eq.(10) is missing the square of the partial derivative, as is Eq.(25)
- The color coded velocity in Fig. 13 seems to be the normalized wind speed $U/U_{ref}$ rather than the relative wind speed $U - U_{ref}$.
- Eq. (18) uses numbers instead of the general description with symbols.
- $U_{sa4}$ is not defined. Is it $U_{free4}$ or the uncertainty $u_{sa4}$?

# Technical Comments

The layout and labeling of the plots should be checked for consistency. Several different labels for the same quantity are used, e.g. "Met-mast wind speed ($U_{mm}$)[m/s]", "Met-mast ($U_{mm}$)[ ]", "Met-mast [ ]", "Met-mast wind speed [ ]"...

p.3, fig.1:
The figure would benefit from additionally marking the turbines T4 and T5 in the sketch (right).

p.4, line 4ff:
The content of the last paragraph is repetitive and should be modified to only give the necessary information once.

p.6, line 12:
The word "increase" lacks an "s". A comma after "(Fig.4)" should be added.

p.9, line 4:
"Approximately 1:1" seems a quite fuzzy expression to me, which could be improved.

p.10, line 4:
"make" appears twice

p.10, line 10:
"utmost" is not very fitting. "outmost" might be the word.

p.10, line 12:
"trough" should be "through"

p.11 line 2:
The reference to Fig. 9 is before referring to Fig. 8.

p.11, Fig 8:
The values of the coefficient of determination $R^2$ should be given in the text, too. The y should be rounded to significant digits.

p.12, Fig 9:
The Figure caption lacks a description of the four different plots.

p.13, line 4f:
The sentence lacks a verb or the grammar should be checked.

p.13, lines 5ff:
Both sentences are confusingly structured. It should be "PC4 compares better with NPC4..:" rather than "PC4 with NPC4 compares better. . . "

p.18 line 1:
"Spinner" lacks the initial "s"

p.29 line 10:
"path with respect to"

p.29 line 16:
"spinner" instead of "pinner"