

## ***Interactive comment on “Establishing a robust testing approach for displacement measurement on a rotating horizontal axis wind turbine” by Nadia Najafi and Allan Vesth***

**Anonymous Referee #1**

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### General comments

The study “Establishing a robust testing approach for displacement measurement on a rotating horizontal axis wind turbine” describes the experiment on a scaled model of operating wind turbine, where the blades displacements were measured using stereo photometry. The paper describes the calibration of the measurement system and the tracking procedure: the two important operations required when applying stereo photometry to operating wind turbines.

Though the paper contains important findings and recommendations, which could be quite useful for those who considers stereo photometry, paper’s quality is not suffi-

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ciently high to recommend it for publication. A major revision is necessary.

### Specific comments

English requires some polishing: some of the paragraphs are not quite clear because of the language. Generally, the paper is written sloppy, there are many unexplained statements; sometimes, no details provided. Also the paper does not provide any critical assessment of the suggested techniques.

The paper claims “robust ... measurement on a rotating ... wind turbine”, however only demonstrates the techniques on a quite small model and does not provide any considerations regarding the scalability of the measurement system.

The reference list could be updated: during the recent years quite many measurements campaigns were reported on real size operating wind turbines, and the references to campaigns from 2002 look quite outdated.

Quality of the figures needs significant improvement.

### Technical corrections

P.2, line 23: should be “are”, not “is”

P.2 line 32: using “well-defined” in this context is confusing.

P.3 line 14: why an Envision wind turbine is mentioned? Is it important in the context?

P.4 line 2. What is the “full resolution”?

P.4 lines 8-9. Consideration regarding the distances is very confusing. What do you mean?

P. 5, line 1. How the marker shown in Fig.3 helps to avoid the mentioned difficulties? Please explain.

P.6 line 17. Using term “smart device” is discussable in scientific literature. Please provide what is the functionality of the device. In the following text, usage of word “Le-

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ica" is too unceremonious. "Leica" is the name of a German company, which produces many other devices.

Fig. 5 seems to be rotated 90 degrees CCW. Why not to put it as it looks in reality? Same for fig.8.

P.7, line 9. Casualty: "the rotor rotates one cycle within 40 pictures" or "the camera takes 40 pictures during one rotor revolution"?

P.8 line 7. Where are "the first and second point (N1)"? It is unclear from fig.6.

Do the terms "line of sight" (p.9, line 6) and "light ray" (p.10, line 11) refer to the same? If yes, avoid using the both terms, if not, please explain the difference.

What does Table 1 mean? How do the numbers quantify the quality of calibration? Where is point 6? The part of the discussion regarding the calibration is very unclear and confusing and require thoughtful revising.

P.11 line 14. Is the "blade elongation" physical? I.e. the blades become longer due to the centrifugal forces? Please explain what do you mean here.

P.11 line 15. Where are the markers 1 and 2. If the marker numbers are important in the context, they should be shown in a figure.

P.12 line 1. The first paragraph: why this? Please provide more understandable explanation.

P.12 line 13: "by looking at pictures"... What pictures? Please provide figures' numbers.

Fig.12 needs numbering (e.g. a,b,c). The vertical axis of fig.12c, must be  $U_z$ . Is it depth? What is the coordinate system? How the values on the graphs correlate the elongation values?

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