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Interactive comment on "Using wind speed from a blade-mounted flow sensor for power and load assessment on modern wind turbines" *by* Mads M. Pedersen et al.

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The paper presents a method for the assessment of the average power curve and loads curves of a wind turbine using a blade mounted pitot tube. The method is evaluated numerically, on the basis of aeroelastic simulations performed with HAWC2 code on a 3.6 MW turbine, and experimentally using measured data from the same turbine. The method is compared against standard wind speed measurements performed using a met mast situated a few diameters upstream of the rotor but also hub velocity measurements based on a spinner anemometer (the latter was only assessed numerically). In the paper it has been clearly shown that the method presents certain

advantages compared to standard measurement techniques such as reduction of the scatter of the measured data even for lower averaging periods which has an additional advantage that resulting power curves are more populated, including more data points. On the other hand, the authors could not prove that application of their method leads to a reduction of the assessment time as anticipated through their numerical analysis. However, this was only due to a special function of the pitch control of the specific turbine in partial load operation. The paper is well written and presents innovative work on the field of power and loads curves assessment. Also, the conclusions drawn and the advantages and disadvantages of the method are very clearly demonstrated and explained both in the text and in the conclusions section. Two specific comments that could be further discussed in the revised text are given below: 1) The method in its present form cannot provide wind speed measurements due to the induction effect. This is of course acknowledged by the authors in the conclusion section. This means that it cannot be used for power curve certification at least in its present form. In connection to the above the authors could elaborate further a) on the potential application/use of the approach in its present form (e.g. power control) b) they could also discuss any recent developments in the direction of correcting the measured wind speed for axial induction effects. 2) One of the shortcomings of the method is that the sensor follows the deflections of the blade/tower. Since the deflections of the turbine cannot be measured, the above effect cannot be corrected for. The authors numerically analyze the effect of blade deflections on the error of the wind speed measurements and they find that this is thrust driven. In the results of fig. 12 it is seen that the error is almost constant over the whole full load range (especially the maximum error while the mean error seems to be indeed higher around the rated speed). So there seems to be some significant contribution also from blade torsion given that thrust (and flapwise deflections) will be relatively low at 18m/s. It might be interesting to make the distinction of the above two effects in your analysis. Editorial changes/modifications are discussed in the accompanying pdf.

Please also note the supplement to this comment:
https://www.wind-energ-sci-discuss.net/wes-2017-25/wes-2017-25-RC2-supplement.pdf

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