

Review on: "On the polarimetric backscatter by a still or quasi-still wind turbine" by Marco Gabella, Martin Lainer, Daniel Wolfensberger, Jacopo Grazioli

It is still my opinion that this manuscript should be published. In terms of its content, I do not have much more to criticize about the present manuscript. Only a few small things still remain that somewhat limit the readability. In addition, I still found some typos.

The more important issues are:

- There are three angles that define the orientation of a rotor blade. Without a sketch it is difficult to make clear which angles are meant. "Nacelle orientation" is quite easily understood. Nevertheless, you did not specify what is meant by a "relative" nacelle orientation. The second angle is normally the "blade pitch" or "blade pitch angle". You call it the "blade angle", but this could also be the angle of the blades rotation (being e.g.  $0^\circ$  when pointing vertically upwards,  $90^\circ$  when pointing horizontally,  $180^\circ$  pointing vertically downwards, and  $270^\circ$  when pointing horizontally to the other side). Furthermore what is a blade pitch angle of  $0^\circ$  and one of  $90^\circ$ ? I assume  $90^\circ$  is the feathered position of the blade. - Please, introduce a clear description.

- I'm still missing the interpretation that during (comparable) fast rotation of the WT's rotor the radar measurement are averaged over a larger rotation angle. This leads to a more stable mean value of  $Z_h$  and  $Z_v$  while the range from minimum to maximum individual measurement is hardly reduced.

On the other hand I'm missing a remark on the very high reproducibility of the measurement as long as the rotor is not moving. It proves how reliable your measurements are. There is (nearly) no unexplainable, external noise but variations are reliably representing changes in the measured signal from the WT.

Both points are important as no operational radar can see what you measured in this experiment. It was fundamentally to keep the radar beam orientation fixed. With a scanning antenna you always see changes due to both: the WT movement and the radar antenna movement.

- I still have my difficulties with all these time information. Please, name the time periods and/or the times and refer to these names. There is no use to call 17:10 to 17:20 period P2 and then, two lines later, you again write 17:10 to 17:20 instead of P2. In line 412 the "sufficient wind condition" lasts from 17:22 to 17:28, line 415 uses the same times, but in line 354 you refer to 17:23 to 17:28 - and I think you talk of the same period. There are more than 50 references to some point in time within the manuscript. Each demands the reader to find that time in the figures; sometimes in more than one. From my point of view, there are 7 main periods: from (i) 17:08 to 17:13 (still WT), (ii) P2b, (iii) 17:14:40 to 17:17 (still WT), (iv) 17:17 to 17:23 (slow movements), (v) 17:23 to 17:28 (fast movements), (vi) 17:23 to 17:39:20 (slow movements), and (vii) 17:39:20 to 17:40 (still WT). You may (and do) subdivide these periods in smaller details (especially Figs 6 and 7). But please, reduce the number of indicated times significantly.

Minor remarks:

line 82: Type in the position. It is  $47.700^\circ$  and  $8.664^\circ$

line 110: Is it important that the electromagnetic field is not planar? It is

nearly because the opening angle of the antenna beam is only  $1.3^\circ$ . The more important point is, that the surface of the WT is not "planar".

line 146: Please point out, that the rotation of  $72^\circ$  is not continuous during the 10 min interval.

line 163: "... measure two values that are orthogonal"? The values are not orthogonal. The corresponding polarization planes are.

line 168: Did you introduce DN? If not, you should not make use of it.

lines 188f: You did not introduce HH and VV, so you should not use these terms.

lines 194ff: "... of the backscattered electromagnetic field within the radar sampling volume ... " is a wrong reference. The scattering took place in the radar sampling volume. The measurement took place in the radar.

lines 225ff: The enumeration is a repetition of what is given since line 214. It should be removed.

line 233: The standard deviation of an equally distributed angle between  $0^\circ$  and  $360^\circ$  is  $360^\circ/\sqrt{12}$ . I recommend to rewrite as  $60^\circ \sqrt{3}$ .

line 245: "has already took place"? Shouldn't it be "has already taken place"?

line 271: Please mention, that the value of 56.5 dBz is a random result. The important point is the stationarity.

line 305: Fig .5 should be Fig. 5

line 321: "... $\Psi_{dp}$  was oscillation between  $11^\circ$  and  $+5^\circ$ ". Please, indicate if you meant  $-11^\circ$  or  $+11^\circ$ . When using the "+" for  $5^\circ$ , do it also for  $11^\circ$ .

line 341: "in the figure shown in sec 3.2". Are you talking of Fig. 6 of this manuscript?

line 343: maximum (green (not red)), minimum (blue (not cyan))

line 358: What is interesting in the fact, that  $Z_h$  reaches the 3rd maximum?

lines 359f: "In correspondence... " This is no sentence. Additionally, I do not get, why you mix information on ZDR and  $Z_h$  of the echoes before and after.

lines 371f: I do not find these ZDR values in the figures. What is wrong?

line 371: Both times have typos.

line 470: The given range of  $Z_v$  values is again arbitrary. The information is the small variation. Additionally, you should emphasize here that a moving radar will never observe this persistence.