

Interactive comment on “Does the wind turbine wake follow the topography? – A multi-lidar study in complex terrain” by Robert Menke et al.

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Response to reviewer 2

We thank the anonymous reviewer for her or his feedback and comments. Below we answer the specific comments in detail:

Comment 1

Since the scan strategy is not suited to study more than a couple of rotor diameters of the wake extent, it would be useful to go into the details of the deficit magnitude. For example, does the deficit magnitude vary as a function of turbine operation and stability?

C1

It would be interesting to analyze the relation of wake deficit to other parameters. However, we cannot determine where exactly the scanning trajectory (Diamond Scan) cuts the wake makes it impossible to determine the absolute velocity deficit. This fact prohibits to set the deficits derived from the Diamond scan in relation to the atmospheric stability or turbine operational parameters. We are addressing this issue in section 4.1: “Such a misalignment causes that deficits profiles measured with the Diamond scan are not necessarily located in the wake center. Nevertheless, in short distance to the turbine, the wake misalignment with the Diamond Scan is expected to be small, which allowed calculating an average deficit for specific sectors in a distance of one rotor diameter. Consequently only selected periods can be investigated over the entire length of the Diamond Scan.”

Comment 2

From Figure 9, I see that the deficit minimum at the wake center seems to exhibit different characteristics for the four different cases. For example, the length of the minimum at the center seems to vary for the different conditions. Is this a function of the stability or turbine operation? Do these differences show up in the other cases?

The operational state of the turbine and atmospheric conditions have undoubtedly an influence on the wake characteristics. The wake measurements shown in figure 9 are used to illustrate the strong vertical wake displacements. Differences in the wake characteristic observed with the Diamond Scan are a combination of different angles between wake and scanning plane, atmospheric conditions and the operational state of the turbine. Unfortunately, it is not possible with the available measurements to isolate one of these factors.

Comment 3

There are a few places in the manuscript that could use some grammar corrections. I have identified some of them. However, I am not proficient in English myself and

C2

therefore it might be a good idea to get this manuscript proof read by an expert rather than rely on my suggestions.

1) Page 1, line 14: "cause" and not "are causing"

2) Page 1, line 20: "cover" and not "are covering"

3) Page 5, line 7: "cause" and not "are causing"

Thanks for these corrections. We carefully read the manuscript again to improve the presentation of this research.

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