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Interactive comment on "Evaluation of the impact of wind farm control techniques on fatigue and ultimate loads" *by* Alessandro Croce et al.

Anonymous Referee #2

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General comments

This paper is in a very relevant and active research area of wind farm control. Many studies have been published in the last decate focused on the benefits of different wind farm control strategies, such as wake redirection and induction control. However, there has been only limited attention on the impact of wind farm control on the loads of individual wind turbines. These papers have not been cited well enought in the introcution section, and the actual contribution of the paper is not clearly motivated by building up on what is already known.

My most important comment, however, is the scope of the study. Fatigue loads in a wind farm cannot be evaluated on a single wind turbine level. A single turbine operating with yaw misalignment in free stream as first in a row may increase its loads

for some yaw misalignments. Behind the turbine, however, the downstream turbines might benefit reduced fatigue loading as the wake is moved away from them. Considering one single turbine in free stream does not provides completely no basis for drawing conclusions on the overall fatigue loading. Instead, all wind directions must be considered in a detailed analysis, including the proper wind speed and direction distributions. Therefore, I cannot approve the paper unless one of the following modifications are made:

- fatigue loads are completely removed and the discussion focusses on ultimate loads only (which I would recommend), or
- it is clearly stated that the fatigue load analysis performed is too limiting to draw conclusions about the overall impact on the lifetime fatigue loading on any turbine in the wind farm, and that further research is needed to study these effects. In doing so, the presented results are to be compared to earlier results by other researches. Notice that the fatigue results, as they stand now, will still not provide much added value in terms of what is already published.

The part of the paper related on ultimate loads is relevant and novel. In my opinion, this should be the focus of the paper. Also here, the story needs to be put in the right perspective. You can't just claim that because of the sensitivity type of analysis, the results and conclusions can be generalized to any wind turbine type. This is obviously not true, as extreme loads depend on many aspects, such as turbine aerodynamics properties, wind conditions, and (supervisory) control system. This needs to be mentioned.

The part on blade redesign is obscuring the focus of the paper, and given its current length, I propose to completely remove Section 5. Same holds for Sections 3.2 - 3.3 (also related to redesign), although Table 1 should remain detailing the load cases.

Furthermore, there are lots of typos and other errors, please revise the language toroughly before resubmitting.

I will be very willing to review the paper after a major revision following above recommendations.

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