WIND ENERGY SCIENCE DISCUSSIONS

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Interactive comment on "Local turbulence parameterization improves the Jensen wake model and its implementation for power optimization of an operating wind farm" *by* Thomas Duc et al.

Anonymous Referee #2

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This paper proposes a method for tuning the Jensen wake model for a wind turbine based upon the locally measured turbulence intensity. The work is based upon field test data at the wind farm La Sole du Moulin Vieux (SMV) in France. The tuned Jensen wake model is then used to optimize the power settings of the wind turbines to maximize the wind farm power capture; this optimization is similar to other wind farm optimizations that have been reported in the literature. The study in this paper considers a single wake case where there is only one wind turbine in the wake of another turbine, and the study also considers a multiple wake case where there is a row of 5 wind turbines where each turbine subsequently wakes (either fully or partially) the following turbine. Finally, the uncertainty of the calibrated Jensen model is quantified, show-

ing that more work remains to be done before the tuned Jensen model can provide guarantees of increases in wind farm power production.

Overall, the paper is reasonably written and there may be useful results to be published, though the conclusiveness of the proposed wind farm control approach is still unclear due to the uncertainty that remains in the tuned Jensen model. As such, I would recommend that a much shortened paper summarizing the tuned Jensen model results based on field data and the uncertainty quantification, and indicating that more studies are needed before the tuned Jensen model can be reliably used for coordinated wind farm control based upon axial induction control strategies. The challenges of axial induction control strategies have already been reported in (Annoni et al., 2016), among other papers.

Some more specific comments and suggestions:

1. Yellow is used for one of the curves in several of the figures. Because the yellow curves are very difficult to see, I would highly recommend replacing each yellow curve with another choice of colored curve, perhaps with a different shaped marker on the curve to distinguish it from other curves in the same figure.

2. In Figure 9, the curves for both SMV1 and SMV7 are nearly identical in color. The curves for SMV3 and SMV4 are also very similar in color. I would recommend at least choosing different shaped markers (not all circles) to help distinguish these curves in the Figure.

3. There are small grammatical mistakes or typos throughout the manuscript, and it is recommended that the authors more carefully proofread subsequent submissions.