

## ***Interactive comment on “The Aerodynamics of the Curled Wake: A Simplified Model in View of Flow Control” by Luis A. Martínez-Tossas et al.***

### **Anonymous Referee #1**

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I consider this to be a well-written and well-structured paper with a clear contribution. I have to say that I am not an aerodynamicist and therefore cannot assess every detail of this paper. I have some minor comments/questions/suggestions:

- It is not clear if this model replaces or extends the FLORIS model as defined in (Gebraad). The caption of Figure 9 states that they use the FLORIS model but with different features (Gaussian vs Curl)? It would be good to explain how the FLORIS model is extended with the Curled Wake model or the Gaussian model.
- On pg 11, “We observe that both models agree very well in terms of power production” How do we see that? Do we see that in Table 1? What is the added value of the 2 turbine simulation? The effects highlighted in the 2 turbine simulations should also be visible in the three turbine case.

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- Table 1, 3 turbine case. It seems that the Curled model is as bad as the Gaussian model (if you compare with SOWFA). The authors argue that this has to do with the fact that there is no decay model. Adding a decay model would also influence the two turbine case. It would be good to add some kind of tuned decay model to really show the strength of the model.
- In general, it is not clear how the different engineering models are tuned.
- Conclusions, the authors state that this work sets a foundation for a simplified wake steering model in a more wind farm control-oriented framework. I believe the authors are referring to an estimation step followed by an optimization step (they can make this more explicit). The authors also increase the complexity of the model which typically means more tuning variable and thus a more complex control problem. It would be good to add a discussion on how this model can be used with respect to the state-of-the-art.
- A literature overview with containing other control-oriented models is lacking.
- In figure 3 and 4 it is not specified which quantity is plotted
- I believe it is “an LES” instead of “a LES”

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