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 #1

Received and published: 6 November 2018

This manuscript deals with an ad-hoc tuning of the expansion parameter of the Jensen model as a function of the incoming turbulence intensity. The calibrated model is then used for the power optimization of a wind farm through a coordinated axial-induction control. The concept is not new, but the application to a real wind farm is very interesting. I would add some comments specifying that the variability in wind direction, thus of wake interactions, and the daily cycle of the atmospheric stability, might lead to a more complicated tuning of the model for real applications, or at least for a real implementation. I found a recent paper with a very similar approach to this, Santhanagopalan et al. 2018 Renewable Energy, 116, 232-243. In that paper, the authors used a RANS model to perform axial-induction optimization of a turbine array for the different incoming wind

turbulence. They used as objective function the maximization of the power capture with a penalization due to the fatigue loads derived by the wake-generated turbulence. It will be interesting to see how these results compare to those presented in this manuscript.

Interactive comment on Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2018-62, 2018.