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Interactive comment on "A Framework for Autonomous Wind Farms: Wind Direction Consensus" *by* Jennifer Annoni et al.

Anonymous Referee #1

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This paper is well-written and well-structured. The presented experimental data is interesting. However, I have my doubts about the usefulness of the proposed method. In the remainder of this review I will further elaborate on this issue.

Major comments: - The authors talk, in the introduction of the paper, about the robustness of the algorithm (..robustly estimate . . ., robustly calculating. . .). It is not clear how the authors define robustness and there is no proof of robustness (either in terms of eq.'s or simulations). The solution of eq.2 is trivial. I believe it is good to make assumptions regarding the measurements (variance or potential bias). - Main criticism: The main contribution of this paper is to add (3) to (2). The authors decide to keep the weights w_i constant. The authors basically take the measurement of the neighbouring into account in a rather ad-hoc way. I have the following questions: o Why should this

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work? o What is the effect of w's on the results? o The most trivial solution is to use a spatial filter. Why not creating a simple spatial filter. (there are different extremely simple implementations possible 1. average of all turbines 2. average of a cluster and you distance to central point as weight). These trivial solutions need to be explored and compared with the proposed method. o Related to my previous point, isn't it a bit of overkill to use the proposed machinery - Section 3.2 can be skipped. Just state that you use ADMM to solve this problem - I would also suggest to include a simulation study in which the sensitivity of the proposed method is explored.

Minor comments: - In the abstract the authors should add more details regarding the methodology they use - Pg 2, line 5, I believe that modern wind turbines also employ estimators to get an estimate of the wind speed and wind direction - Section 2 can be shortened. The information density is rather low - Pg 7, rho is not defined in (4)-(5) but suddenly it appears in the experimental section. I believe it is a tuning variable of the ADMM algorithm and I don't understand why it should be tuned for the experiment - Check consistency of the literature list.

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