Review of the manuscript entitled "Observer-based power forecast of individual and aggregated offshore wind turbines," written by Frauke Theuer, Andreas Rott, Jörge Schneemann, Lueder von Breman, and Martin Kühn.

In this manuscript, the authors propose a combination of remote sensing LiDAR forecasting techniques and SCADA-based techniques to predict individual and aggregate wind turbine performance. Calibration, as well as probabilistic predictions, are discussed, and the results are compared with benchmark prediction methods. In unstable atmospheric conditions, the proposed approach improves upon the benchmark cases.

The introduction of the manuscript provides clear motivation and relevant background as well as indicates how the current work will add to the current literature. Section 2 aims to introduce the forecasting methods used in the work. Previous LiDAR forecasting methods are first introduced, followed by SCADA methods. Finally, the combined prediction method is explained. All explanations are straightforward and build logically on each other so that the final forecast method for individual turbines is well understood. Finally, the individual probabilistic forecasts are aggregated into a farm-level probabilistic forecast. Overall, this section is good. The main comment is that it is not always clear which contributions are the authors' and which predated the manuscript.

The next section discusses the results of the forecasting methods in a case study. First, the experimental campaign is described as well as the forecasting parameters specific to the site. In the paragraph beginning at line 208, further justification could be given regarding the selection of these parameters. The forecasting approach is applied first to individual turbines. The strengths of the LiDAR-based approach - predicting turbines near incoming conditions - as well as the strengths of the SCADA-based approach - predicting inner turbines - are shown to complement well. Accuracy of forecasts with wind direction and considering cases where turbines may not be capturing data is discussed. Next, the two approaches are combined into the observer-based approach. The complementary nature of the LiDAR and SCADA approaches is clear in the increased forecast availability and accuracy of the observer approach. However, the persistence method is still shown to outperform the observer approach in stable conditions. Calibration is shown to improve observer performance. Finally, the aggregate forecasts are evaluated as well as deterministic forecasts. The benchmark persistence method was improved upon by observer models for unstable conditions but not stable conditions. Overall, this section is excellent, providing a logical evaluation of the models, a clear rationale for the model behavior, and good support for the use of observer methods in unstable conditions.

The final two sections first discuss the impact of the observer method given other forecasting methods and specific implementations and then conclude the manuscript. The discussion section is valuable in placing the observer method in the broader context of application in other sites while considering its usefulness compared to other methods. The final section concludes the paper while highlighting areas for future improvement. These two sections combined do very well to highlight the potential of the observer method while also conceding that further improvements are possible.

Additional comments are listed below:

Comments:

- Section number is missing in reference on line 78.
- Paragraph not indented at line 208.
- In figure 3, keep all subplots the same size; it would be helpful to indicate on a subplot illustrating the entire farm (a-c) the region highlighted in the subset (d).