

Wind Energ. Sci. Discuss., referee comment RC1
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Comment on wes-2021-108

Andrew Scholbrock (Referee)

Referee comment on "Fast Yaw Optimization for Wind Plant Wake Steering Using Boolean Yaw Angles" by Andrew P. J. Stanley et al., Wind Energ. Sci. Discuss.,
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Thank you for writing this article in a clear and well organized manner. I really liked how it was organized into sections exploring different parameters of the experiment. With that there are some minor points of confusion that I think could be cleared up to improve the article:

Page 3 line 75: you refer to "the square root of the sum-of-squares" method with no citation. If it is the same as (Crespo et al., 1996), then I would suggest moving that citation to the end of the sentence. If it is from something else, then a citation should be added.

Page 5 line 106: the bounds of 0° to +30° are considered for yaw optimization with no mention of negative yaw angles. Some explanation should be given as to why negative yaw angles are not considered in this article.

Page 5 lines 107 & 113: The word "greedy" is used to describe the Boolean method. This is confusing to me because the word "greedy" has been traditionally used to mean "business-as-usual" in wind plant optimization. I would consider sticking to that convention and use a different word here to describe the Boolean method.

Page 6 line 135 & figure 2 title: you mention "we optimized turbine rows...", which seems contradictory to the figure title "Turbines in-line". I think what you are trying to say on line 135 is "we optimized an individual row of turbines varying from 10 – 50...". Please consider changing this sentence to avoid confusion.

Page 8 paragraph starting at line 165: It is probably worth mentioning here how often a re-optimization of yaw angles needs to occur for a production wind plant during operation. This would further make the case for a need to have a computationally efficient algorithm as the optimization time would really start to add up with re-optimizations for the continuous method when compared to the Boolean method.

Page 9 lines 196 & 197: you refer to a wind plant arranged in a grid and contrast this against an in-line arrangement. To me a grid is several sets of in-line turbines, so they don't really contrast one another. Something needs to be done to clear this up. I do agree that an in-line arrangement does contrast a random arrangement. Also "in line" here should be changed to "in-line".

Section 4.2: It was surprising to me that the 285°/345° and 300°/330° pairs of wind directions do not give identical results as the pairs are mirrors of one another about 315° for a regular square grid arrangement. Perhaps this is because only 0° to 30° optimized yaw angles are considered. Some mention should be made about this in this section as to why the results are not identical. Additionally, if it is because of only optimizing positive yaw angles, then it should be reiterated here why negative yaw angles were not considered in this article.

Page 14 line 253: Here it is stated that seven random wind plant layouts were generated. Why not more? Why not less? It should be mentioned why seven was chosen for the results presented in this section.

Page 15 figure 10: A thought I had after seeing this figure is that it would be great if a scatter plot was included in this paper showing "computational time ratio" vs. "optimized power ratio" from the two right plots in figure 10. This figure could show an aggregate of results from the scenarios across the article. I think that this scatter plot would greatly add to this paper by showing how much power improvement you get at the cost of how much additional computational time, which is one of the main points that this article is trying to make.

Again, overall, nice job!