

Interactive comment on “CFD based design of diffuser augmented wind turbines” by Ertem Vehid

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Thank you for your submission. I believe there are some fundamental issues with this paper describing CFD-based design with the diffuser coefficient as an evaluation metric. However, the relationship between diffuser coefficient and the performance of a rotor+diffuser combination has not been made clear. Improvements to rotor performance following the application of the modified Glauert Optimization Method has not been discussed. No power coefficients have been shown for the diffuser optimized designs, but in the conclusions the author claims that all designs can exceed Betz; however, he also points out that these power values should be different than 3-D CFD because they neglect the established issue of flow separation. In reality, accounting for separation should actually reduce performance.

Moreover, the paper lacking in many details and discussion, including those regarding

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the CFD model despite the paper title emphasizing a CFD focus. The CFD airfoil results have not been sufficiently validated and the connection to the full rotor design is unclear—^{the initially selected optimal airfoil (S1223) is later replaced with a NACA0012 design.} The introduction does not properly motivate the present work (the author states that a main design challenge is flow separation, which has been neglected in the present study) or choice of design concepts, and has no references to recent work. Please see the attached annotated PDF for additional comments.

Please also note the supplement to this comment:

<https://www.wind-energ-sci-discuss.net/wes-2019-75/wes-2019-75-EC1-supplement.pdf>

Interactive comment on Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2019-75>, 2019.

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