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WIND ENERGY SCIENCE DISCUSSIONS

Interactive comment on "Multi-element ducts for ducted wind turbines: A numerical study" *by* Vinit V. Dighe et al.

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Great paper overall!! Glad to see that advanced Research is on-going in this field for small scale wind-energy. I generally agree with the conclusion of the paper. I also have a few questions:

In regards to the experimental data set from a wind tunnel experiment by Igra & Olsen,
1. Is the Reynolds number disclosed for the experimental test data from Igra/Olsen? It appears to be approximately .∼ 400000 – 440000 at 32 m/s, based on the model dimensions listed in the paper. Pls. correct if actual Re data is known. What is the Reynolds# (Re)range in the RANS/Panel iterations?

2. The augmentation factor scale for the Igra/Olsen experimental data set shows a rise

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Discussion paper

in power augmentation (for yawed inflows, Fig. 5, Model B) or 130% power augmentation at +/- 10° inflow compared to 120% power augmentation for 0° in-line flow. Is that the correct interpretation for Model B, Figure 5? The RANS and Panel solutions for Model B show very little change in power augmentation from yawed inflows +/-10° and appears to be consistently 120% power augmentation factor.

3. The optimum design, from the paper's conclusion, is then: the multi-element configuration with an axial gap clearance of 5% of primary duct chord length, positively displaced (below the TE of the primary duct); second element length that is 35% of chord; and deflection angle of less than 10° The second element camber in the paper (NACA 412) obviously has a camber less than or equal to the primary duct aero-foil camber. Any data on performance for thicker camber foils for the 2nd element that is 35% of chord; and for 2nd elements that exceed the aero-foil chord of the primary duct, by, as an example, 50 to 150% of chord.?

Please also note the supplement to this comment:
https://www.wind-energ-sci-discuss.net/wes-2019-21/wes-2019-21-SC1-supplement.pdf

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