

# ***Interactive comment on “Control design, implementation and evaluation for an in-field 500 kW wind turbine with a fixed-displacement hydraulic drivetrain” by Sebastiaan Paul Mulders et al.***

## **Anonymous Referee #2**

Received and published: 18 June 2018

Thank you for your submission. In general I found the paper to be interesting and well-presented. Background literature was complete and informative, and the introductory material explains well what this paper adds to the growing literature. The figures and illustrations are particularly well done and helpful. The writing is clear, with only very few grammatical errors. The paper is well structured, such that one new to hydraulic-drivetrain wind can follow. Finally, the inclusion of field results and comparing to the theoretical work is informative. Excellent work.

Therefore, only a few comments to be given:

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Overall: Is there provided, or could the authors provide, a quick impression of how the efficiency of the proposed system, in total, would compare to a similar conventional system? For example, given the same rotors, what would a standard efficiency to final electrical power be (90%?) and what would it be for this system?

Specific:

3.2.1: "and vice versa for the latter.." I could not fully understand what is meant by this. Could a Bode plot of the transfer functions be included to visualize the inverted notch functions?

Eq 38: The B-matrix in this version includes the inputs? There is a dot following the matrix but it is not clear what the dot product will be with? In eq 54 there are only 3 columns total for the 3 B matrices, but are there 4 variables provided in this version?

Section 4.1.1: "advantageous for ... operate a lower tip-speed ratio", this is counter-intuitive, but do I understand correct that although the rotor power will be reduced, the improved hydraulic efficiency will lead to higher final electrical power? Is this demonstrated conclusively?

Section 4.1.2: Does the lower TSR also risk increased occurrence of dynamic stall?

Fig 16: Title is incomplete

Fig 18: The legend is hard to understand, why the lower-case bold "without" following the period? Since the phase margin is discussed later, could it be indicated in this figure?

Fig 22: Color legend missing label

Fig 24: Good figure, just wish to confirm, is rotor speed scaled correctly? Does it always stay so close to its maximum? Or is this period special in that there is only a brief excursion into region 2 (which makes sense, you've selected a period covering 2,2.5,3) just want to be sure.

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An interesting, and well-presented paper.

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