

Interactive comment on “Aero-elastic Wind Turbine Design with Active Flaps for AEP Maximization” by Michael K. McWilliam et al.

Anonymous Referee #1

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The paper presents the aeroservoelastic optimization of wind turbine rotor blades based on an established wind turbine optimization code by Zahle. The novelty of the paper is to study the design impact based on a full optimization of smart rotors.

Overall the paper is well written, however, there can be some clarifications made. In chronological order:

p1. The state-of-the-art reference is 8 years old (Barlas and Kuik). p1. Barlas et al Barlas et al (repetition) p3.25-30 The loads of this design were used as constrained: Do the authors mean the ultimate and the fatigue loads or the loads per wind speed? p3.35 The flaps are controlled with respect to the wind speed. Do the authors mean the hub height inflow or the local sectional wind speed where the flaps operate? p4.5 industrial industrial (repetition) p6.Table 5 The optimizer finds a very high tip speed

for the blades. This can lead to leading edge erosion (and noise, which would be a lesser issue offshore). Did the authors study how limiting the tip speed would change the optimized design? p6.15-17 The authors mention profile drag. For the operation of (discrete) flaps also induced drag of the flaps should be taken into account. A reference to the near wake model would be good. p6. The co-optimization finds higher deflection angles for the flaps without increasing the power. Is there a benefit that is hidden to the reviewer that could point towards using a combined optimization or are the results from the baseline with flap more realistic for actual applications?

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