

Interactive comment on “What are the benefits of lidar-assisted control in the design of a wind turbine?” by Helena Canet et al.

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The paper deals with the benefits of including LAC in turbine design, evaluated in terms of LCOE. It is shown that LAC can reduce the mass of the tower, increase its height (which increases production) or extend its operating life. The LAC also allows to reduce the stress on the blades and thus to modify the structural properties of the rotor. The study is conducted considering the "modifiable" DELs, i.e. the DEL for which the LAC has an impact on the results. To evaluate the benefits of the LAC, the DELs and extreme loads are scaled-up, based on the results of a study Bossanyi, presented in 2014. A strong simplifying assumption is made regarding DEL scaling, which assumes that the reduction is independent of the wind speed and load range. This work seems to suggest that the gain obtained by the design of the turbines including the LAC is

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negligible in most cases, given the current costs of Lidar and its maintenance costs. The authors are aware of the limitations of the study, and it is explicitly stated that these results are strongly impacted by the its assumptions. Anyway, this issue (identified by the IEA Task 32) has a real interest, and this paper provides a good starting point for its understanding. In my opinion, an important improvement to this work would be to consider the variability of the gains given by the LAC (or even to determine from which gains LAC becomes economically interesting), as the potential benefits depend on the used control technique, on its settings, on the operating conditions and, obviously, on the NON-LAC technique to which LAC is compared. This would have the merit of identify a level of performance that LAC would have to reach in order to be economically interesting, and could strongly incentive further research efforts on this topic.

Minor remark: At some points the paper is a bit hard to read. In this sense, a schematic summary or table, and an effort to make the explanations simpler and clearer can make the paper more readable.

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