

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

Anonymous Referee #1

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Interesting approach to a relevant question. Explanations sometimes not so easy to follow. Difficult to assess whether the conclusions can really be considered to be general. Dealing with design load cases, especially ultimate loads, can be very case-specific. Perhaps more emphasis should be given to the results giving useful indications, but that the issues should be looked at in detail for any specific case. (Line 109-110: yes, this approach makes the results less specific, but also less relevant to any particular case.)

Abstract wording, line 7: "with potentially benefits" suggest "with potential benefits", and in "essentially limited to the sole tower", suggest deleting "sole".

Load cases, Table 1: What about other fault cases? Further down it seems they are assumed to be unaffected, but often they need vary careful thought, and some may

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prove to be troublesome. As an example, what about the case of ultimate loads when the lidar fails to provide a good signal for any reason, and the failure is not detected? There will always be times when the lidar signal is unavailable, when the controller should revert to a safe mode. I don't think this has been considered. If the failure is undetected, so safe mode is not activated, it is possible that the control will result in higher ultimate loads than without any lidar at all. This is just one example. The results should include a strong caveat about load cases that have not been considered but that may affect the conclusions. (Line 139: "Hence, LAC-induced load reductions were assumed to be null for these DLCs, which is a conservative choice" - it is not necessarily conservative - LiDAR could make things worse in some situations.)

It might be helpful to list the DLCs that are *not* considered, with reasons why not considered important (some will be obvious of course).

Line 115: "guaranteeing" (spelling)

Line 169: "it is assumed that load reductions are independent of wind speed" - seems a strange statement. Load reductions may be much greater above rated when pitch control is active, and can depend strongly on wind speed.

Figure 6: Make figures bigger to help legibility. Why are some bars missing?

Figure 7: It would be nice to display the non-LAC mass increases compared to 20 yr life, and how they change with LAC.

Line 429: "radar" should be "lidar"?

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