Reply to comments by Reviewer Nr. 1

Giorgia Guma on behalf of the authors
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The authors would like to thank the editor for her efforts and valuable comments in this final process of review. They are very much appreciated and incorporated into the revised paper.

In the present document the comments given by the editor are addressed consecutively. The following formatting is chosen:

- The editor comments are marked in blue and italic.
- The reply by the authors is in black color
- A marked-up manuscript is added. Changed section with regard to the comments by the editor are marked in yellow.

General comments

1. "*The prior editor noted that the paper is missing a "story line". What is the main result? This is still not sufficiently addressed. Many of the detailed comparisons of the model in different configurations are not so interesting; please try to remedy this.*"

Thank you for your comment. In order to make the main result and the "story line" clearer we modified additionally the conclusions, see **R1:G1** (page 23, line 382), **R1:G1a** (page 24, line 413), addressing the main results this time additionally by the use of bullet points. The reason why we decided to compare the different configurations in detail is that, when computing those with CFD, computational costs vary enormously. It is therefore of interest, especially for the industry, to know limitations and differences within the high-fidelity modelling approaches, as addressed now additionally in the introduction at **R1:G1b** (page 2, line 47).

2. "*And I agree that it might be a miss-interpretation writing: This has a direct effect on the DEL, being mostly affected by turbulence than flexibility and blade-tower passage together Because it needs a simulation with turbulence of a stiff and flexible structure. Although it's a stiff turbine I would guess that the DEL of the tower bottom moments and of blade moments are influenced by flexibility*"

Thank you for your comment. We understand that there might have been a bit of confusion and therefore we reformulated this sentence (and the conclusions) in **R1:G1** (page 23, line 382), **R1:G1a** (page 24, line 413). We simulated both the rigid and flexible turbine in turbulent inflow conditions and calculated the respective DEL based on the blade moments at the rotor center (tower bottom moments have not been considered). In this way we observed that the introduction of turbulence is the factor that mostly increases the DEL, independently of the flexibility, as shown in fig. 21 in the paper. Flexibility is, of course increasing the fatigue, but

much less in comparison to what turbulence does (comparison DEL "entire turbine in turbulent inflow FMT" vs "entire turbine in uniform inflow FMU"). This is what we wanted to explain with that sentence and that was probably a bit unclear.

3. "*Finally, please review and consider as a reference the work below with BEM and CFD simulations on the same turbine: Citation (APA): Madsen, H. A., Sørensen, N. N., Bak, C., Troldborg, N., Pirrung, G. (2018). Measured aerodynamic forces on a full scale 2MW turbine in comparison with EllipSys3D and HAWC2 simulations. Journal of Physics: Conference Series, 1037(2), [022011]. https://doi.org/10.1088/1742-6596/1037/2/022011 where the real objective of applying CFD in turbulent inflow in comparison with BEM is more clear than in the current study.*"

Thank you for your valuable suggestion. The citation has been added with a short comment in **R1:G3** (page 7, line 153), within the description of the adopted BEM model.