

Interactive comment on “Fatigue lifetime calculation of wind turbine blade bearings considering blade-dependent load distribution” by Oliver Menck et al.

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Thank you very much for the criticism. The paper was updated to clarify most of the mentioned points, but there will also be a reply in the following.

This manuscript describes and compares three different approaches to calculate the load distribution and the lifetime blade bearings undergoing repetitive oscillations, for which the methods included in the Standard ISO 281 need to be adapted in order to take into account of different assumptions. The load calculation is based on FEM simulations. The manuscript is well organized and clearly written. The following issues should be addressed: 1. With reference to the FEM model described by Figures 1 and

C1

2, where the mesh is shown, it would be interesting to have some additional information in the text (number of elements, computational time, etc.).

The entire model consists of approximately 855000 elements and 956000 nodes which results in a computational time in the range of 25 minutes using a PC with an Intel Xeon E5 3.7 GHz processor and 128GB RAM.

2. In the connection of the bearing to the mating surfaces, the effect of the bolts and of the friction forces is not considered and the component is modelled as bonded to the mating surfaces: the conclusion that the influence of this simplification is assumed to be negligible should in my opinion be supported by some additional discussion or speculation. In large bearings supported by deformable structures, the connection of the bearing to the structure can be critical. For this reason, even if this aspect does not affect the main objective of the paper, whose most relevant contribution remains the comparison among the different ways in which calculated loads are introduced in the determination of the equivalent load, some discussion on the bolting of the bearings rings and of its potential impact on the loads on the rolling element would improve the quality of the paper.

Not implementing bolts might lead to a little more flexibility of 100 the bearing rings which can result in a larger tilting of the rings towards each other. In turn the loads on both rows are distributed slightly less evenly. In-house investigations have shown that this effect only has a very small influence on the bearing's load distribution. Thus, the effect of this simplification is to be assumed negligible.

3. It would be interesting to include some contour to show the results of the simulation (e.g. stresses, displacements, etc.).)

An example of a simulation result showing bearing deformation has been included in the paper.

4. I suggest to avoid the use of citations in the Conclusions. If they are relevant,

C2

it would be preferable to add and discuss them in the text, without repeating in the Conclusions.

The disussion of the results has been extended and citations from the conclusion have been moved to the end of the "Results and discussion" section.

5. In some parts of the text, as for instance in paragraph 2.3, the use of linking words is suggested to connect the sentences. Right now, each sentence is really short, and it seems to read a list of bullet points. Even if In this way the message is very clear, I would suggest a more fluid style.

The text has been changed to be more readable.

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