

Interactive comment on “Friction torque of wind-turbine pitch bearings – comparison of experimental results with available models” by Matthias Stammler et al.

Anonymous Referee #1

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The manuscript presents a series of friction measurements in the pitch bearing of wind turbine blades under different speeds and loads. Based on these results the authors conclude that although there is a significant load dependence, there is also a significant initial friction moment in the unloaded condition. They observe no speed dependence.

The manuscript also intends to apply four different bearing friction models to reproduce the experimental results and concludes that none of them can capture the obtained experimental results sufficiently.

The reviewer sees the following fundamental limitations of the work in its present form:

- The friction torque measurement system is described very briefly (line 5, page 3),

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despite its central importance for the presented work. There should be at least a figure showing conceptually the configuration of the pitch drive and the instrumentation . Corresponding text describing such a figure should also be added.

- Too little information regarding the application of the different friction models is given, in order to support the conclusion that all considered models are insufficient. The information given from line 10 on page 11 to the end of page 13 should be more thorough and be presented more systematically. It is also unclear how the roller element loads extracted from the FE model are used here. An example of a corresponding FE result would help here.

- Normalizing with respect to the average torque measured at the maximum load, limits the scientific value of the presented data significantly. Since the measurements appear to be the main contribution of the model, either the absolute values should be provided, or data normalized with respect to a well defined quantity.

The reviewer also has some practical comments

- The term movement is in general too broad for a scientific text. In many places of the text the term can be replaced with more specific ones such as rotation and shearing.

- In several places the subscript "ges" is used instead of the English equivalent "tot".

- the argument in line 19 on page 10 is unclear

- "had to be chosen" (line 13, page 11)

Based on these observations the reviewer would recommend reconsidering the manuscript only after a major revision addressing the aforementioned points at the least.

Interactive comment on Wind Energ. Sci. Discuss., doi:10.5194/wes-2017-20, 2017.

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