Wind Energ. Sci. Discuss.,
https://doi.org/10.5194/wes-2020-39-SC1, 2020


Open Access
WIND ENERGY SCIENCE DISCUSSIONS

# *Interactive comment on* "Condition Monitoring of roller bearings using Acoustic Emission" *by* Daniel Cornel et al.

**Daniel Cornel**

daniel.cornel@cwd.rwth-aachen.de

Received and published: 4 May 2020

Hello, thank you for your comment. It is indeed true that there is a large number of investigations focusing on the comparison of vibration and Acoustic Emissions (AE) signals in regard to rolling bearing damages. Also, the supposed higher sensitivity of AE in general has already been discussed and highlighted. However, to my knowledge, these investigations have so far been carried out mainly on single bearings or rollers that have already been damaged (e.g. by hardness indentation or artificial scratches). The novelty of our approach is on the one side the fact that we use a four bearing test rig without any pre-damaged bearings. On the other side, this paper presents novel in-situ investigations regarding the sensitivity of AE towards the detection of events prior to a surface damage caused most likely by poor lubrication conditions or crack propa-



gation from the material to the surface. The results show that the novel correlation of AE signals to damage mechanisms or at least promoting operating conditions requires much more detailed investigations. Even the differentiation between good and bad lubrication conditions turned out to be quite challenging. Furthermore it was shown through the novel monitoring of a lifetime test, that noticeable deviations in the AE signal could be detected up to ∼50 % (130 hours) before a bearing failure occurs. These deviations need to be further investigated, but are possibly associated with damage pre-stages, such as crack initiation, crack-propagation or structural changes inside the bearing component and might result in an earlier damage detection in future.

---

Interactive comment on Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2020-39, 2020.