Reviewer 2

The paper deals with an interesting topic - electrostatic discharge through bearings in wind turbines. Please consider the following comments:

- Please make it clearer when it comes to differences between the test setup and real wind turbine case. In a wind tubine (Fig. 4), an important point is the path of the discharge, either through the brushes or through the bearings. While in the test setup (Fig. 14), it seems that the only path is through the bearing. Is this correct? If yes, this must be highlighted more in the paper and conclusions.

Thank you for the valuable question. The connection is correct in the test. The explanation is given in next paragraph. In the paper, we add relevant explanation in session "6.1 lab test condition and bearing connection" (around line 200)

In the lab test, the brush is used as a test sensor for the shaft voltage. In the real wind turbine, based on our test, the brush impedance is > 10kΩ whereas the bearing is several ohms. They are not at the same level and not comparable. The figure below shows a test for the brush contact resistance in a 2MW wind turbine.

In the lab setup, the relative size of the bearing and the brush is not the same as the real wind turbine. The brush impedance is several ohms, and the bearing is about 10 kΩ. Thus, in the lab test, the brush is used as a test sensor instead of grounding path.

Updated content in the paper

"Different from the real wind turbine, in the lab test the brush is served as a voltage observer instead of a ground path. In the real wind turbine, based on our test, the brush impedance is > 10kΩ whereas the bearing is several ohms. They are not at the same level and not

comparable. In the lab setup, the relative size of the bearing and the brush is not the same as the real wind turbine. The brush impedance is several ohms, and the bearing is about 10 kΩ. Focusing on the impact of ESD on the main bearing, the brush only serves as a voltage observer (directly connected to the oscilloscope).The main bearing's outer ring is grounded via a current shunt. Connected in this way all the current will, in principle, pass through the main bearing. Figure 14 shows the test connection for the setup. "

- Please elaborate more on this sentence (page 17 - 312): "Compared with the AC voltagedriven bearing current, the ESD-driven bearing current appears at a lower trigger voltage and higher current amplitude". Please explain how this could be a conclusion of this paper.

Thank you for the reviewer's thoughts and comments, we have updated the paper, more discussion and explanation about this phenomenon are elaborated in session 7 around line 295.

Updated content in the paper

"In the AC-driven case in test A, the accumulated charge on the bearing appears as a tidal waveform, which means the charges accumulated and dissipated periodically from the source. In the ESD-driven bearing current, the voltage is a DC source, and the charge build-up field is a continuously increasing field. Compared with test A in Figure 18, even though the voltage level in test C (Figure 18) is lower, the partial electrical field is stronger than the case of AC voltage in test A. "