Dear reviewer,

Thank you for your time and effort spent into the review of our manuscript. We hope this reply sufficiently answers your questions, we also updated our manuscript where it was necessary.

1. Under Abstract section, there should be executive summary of the quantitative conclusions of the proposed research. The abstract should be rephrased to make it more wholistic of the complete study on the manuscript.

Thanks for the comment. The abstract updates :

Non-destructive inspection (NDI) is useful in the industrial sector to ensure that manufacturing follows defined specifications, reducing the quantity of waste and thereby the cost of production. Optical Coherence Tomography (OCT), a well-known diagnostic technique in medical and biological research, is increasingly being used for industrial NDI. In the mid-infrared (MIR) wavelength range, OCT can be used to characterise parts and defects not possible by other industry-ready scanners, and enables better penetration than conventional near-infrared OCT.

In this article, we demonstrate NDI of wind turbine blade (WTB) coatings using an MIR OCT scanner employing light around 4 µm from a supercontinuum laser source. We inspected the top two layers of the coating (topcoat and primer) in two different samples. The first is to determine the maximum penetration depth, and the second one is to imitate defect identification. We also developed a basic algorithm to extract the thickness layer of the topcoat and primer. The results of our study confirm that MIR OCT scanners are promising for coating inspection and quality control in the production of WTBs, with performance parameters not achievable by other technologies.

2. Considering the inspection depth upto two layers, what structural advantages can be accomplished as initially is quoting that the reducing the quantity of waste and thereby cost of production. Please add justification for the proposed study?

The focus of this study was limited to the development of the coating layer inspection performance and potential. However relevant, investigations of the structural is out of the scope of this work.

3. What is the capability of the described NDI techniques application on field blades compared to conventional inspection techniques.

This NDI technique has the capacity to do subsurface characterisation and 3D visualisation without damaging the material used inside the coating, as there is no radiation emitted by the source like X-rays or UV. This also provides a safe working environment for the user.

The sample is characterised as normal at the surface of it and does not require any rotation of the sample to have access to the 3D volume information. For a large system like a blade, this reduces the complexity of the characterisation, and in principle can be expended to the field with proper amount of engineering. We are collaborating with the company NORBLIS (Norblis.com) which is looking into the engineering challenges of MIR OCT scanner usability and deployment.

The resolution of the OCT scanner is intrinsically linked to the OCT system (the light source used and the optics inside the head scan) and not to the sample size. In summary, the MIR OCT system will be able to characterise with the same finesse an electronic chip and a wind turbine blade.

4. What is the threshold capability of inspection depth for the mentioned MIR OCT technique.

The capability of the system is the one presented ~360 µm of penetration depth, but we noticed several months after having done the experiment that our upconversion system had a problem. The conversion

efficiency dropped by a factor of 2 after seven years. The module is currently in reparation. With this the penetration depth might be even better than the reported.

5. Apart from the introducing the application of MIR OCT technique to wind blades from other applications, what are the extended research capabilities addressed in the proposed manuscript?

The MIR OCT scanner has the potential to characterise various nonorganic materials, such as ceramics, paper and electronics components. The wavelength of the source used allows a better penetration than conventional OCT (with NIR wavelength) due to a reduction of scattering and so of the general losses.