

PhD Research position
In the frame of the EU-ITN-project
NDTonAIR
at the Department of Materials Engineering (MTM)
KU Leuven, Belgium

**Structural Health Monitoring (SHM)
of material defects in aircraft components**

Highly motivated applicants are invited for a 3-years research and training position in the field of non-destructive testing (NDT) and structural health monitoring (SHM) of aircraft components, potentially leading to a PhD degree. In addition, the applicant will have the option to follow parts of the training course on Aircraft Maintenance according to the EASA rules, part 66 at Brussels Airlines in Zaventem (Belgium). All research and training activities are part of the EU-funded International Trainings Network (ITN) "Training Network in Non-Destructive Testing and Structural Health Monitoring of Aircraft structures (NDTonAIR www.ndtonair.eu).

Major research objective: In 2014, KU Leuven has proposed and validated a new structural health monitoring (SHM) technique in which the propagation of crack due to fatigue cycling in a metal plate was monitored by exploiting the modulation of ultrasonic waves due to loading-induced opening and closing of the crack. In the proposed PhD work, the approach would be further extended to (i) realistic aircraft components including composites by (ii) exploiting the possibility to use multiple sending and detecting, (iii) making use of piezo-strip-arrays to perform ultrasonic mode selection, (iv) correlate the results to the technique of electrical crack propagation gauges based on percolation sensors. To validate that approach, dynamic loading conditions (static and fatigue) by state-of-the-art material testing equipment (Instron) in all temperature ranges required will be applied and the evaluation of material damage is investigated by fractography (Scanning electron microscope) and micro X-ray tomography for composites (Skyscan).

As the research topic is situated in the field of ultrasonics and related sensing applications, applicants are required to have an excellent proven background in related natural or engineering sciences, including profound knowledge on signal processing as well as on the respective hard- and software. Moreover, appropriate skills in English speaking and writing are mandatory.

The work will be performed in the group of "Materials Performance and Non-destructive Testing" at the Department of Materials Engineering at KU Leuven, as well in the "Laboratory of Acoustics" of the Department Physics and Astronomy including short-term research and training stays at international project partners. As a part of an International Training Network (ITN) of the EU, candidates must prove to fulfil the respective eligibility criteria for this position: (i) not residing in Belgium for at least 24 months in the last 3 years, and (ii) having not more than 4 years of research experience (working as researcher after obtaining your master's degree). Please submit your complete application until the 1th of December, 2016.

Contact:

Prof. dr. Martine Wevers (martine.wevers@kuleuven.be)

Co-ordinator research group "Materials Performance and Non-destructive Testing" -
Department of Materials Engineering – KU Leuven