PhD student position in experimental nonlinear acoustics

Project description

We look for a candidate for a 4-years PhD student position in ultrasound nondestructive testing and numerical modeling in the framework of a collaborative project between two major scientific organizations located in the north of France and in Belgium: Université Lille Nord Europe and KU Leuven.
The proposed research program is a continuation of our efforts in nondestructive testing (NDT) of solids based on contact acoustical nonlinearity, i.e. the modelling and response analysis of the highly nonlinear behavior of defects (cracks, delaminations) that empowers their detection. The principal project objective is to establish an agreement between theoretical modelling and experimental observations in nonlinear acoustic and/or thermoacoustic NDT (vibration induced thermal effects) in solids with frictional cracks. To achieve this, dedicated acoustics experiments will be combined with numerical modeling that integrates semi-analytical models from contact mechanics into a FEM environment. The result is a simulation toolbox that describes wave propagation and vibrations, as well as the induced thermal effects in a sample containing frictional cracks. This will allow us to estimate relevant parameters of these defects from measured data.

Your job:

- Contribute to the creation of a modeling support tool: develop frictional contact models, expand multi-physics finite element code for wave propagation and vibration induced thermal effects
- Participate in manufacturing samples with calibrated/engineered defects
- Conduct acoustic measurements (nonlinear ultrasound, vibrations, thermosonics)

Your profile:

- Strong background in physical acoustics and (non)linear acoustics in solids
- Ability to perform acoustic experiments and measurement analysis
- Skills in numerical simulations (finite elements, finite differences, programming) and in signal processing
- Good knowledge of English

Our offer:

- A position based in Lille and Kortrijk with frequent traveling between the campuses, with a starting date in October/November 2018
- A typical salary for French or Belgian PhD students (exact value to be defined) for 4 years
- A prestigious Dual PhD diploma from Ecole Centrale de Lille and KU Leuven
- Introduction in a huge variety of skills: acoustic experimentation, thermography, microfabrication technologies in cleanrooms, FEM modeling, contact mechanics
- The possibility to enter the European non-destructive testing community and to establish connections to academic and industrial partners for your carrier continuation

How to apply:

Please submit your enquiries and application (including letter of motivation, CV and exam results as pdf files) to:
Vladislav Aleshin, IEMN Lille, vladislav.aleshin at iemn.univ-lille1 fr
Koen Van Den Abeele, KU Leuven Campus Kortrijk, koen.vandenabeele at kuleuven be
The application deadline is July 31, 2018