Title: DEVELOPMENT OF FRACTURE TOUGHNESS TESTING TECHNIQUES FOR NON-SHARP DEFECTS

Type of award PhD Research Studentship

Department Mechanical Engineering

Scholarship Details Scholarship covers full UK/EU (EU applicants who have been resident in the UK for 3 years prior to 1st September 2017) and a generous tax-free annual stipend (at least £16,000, subject to contracts). EU nationals resident in the EU will qualify only for PhD tuition fees unless they have been permanently resident in the UK for at least the last three years.

Duration 3.5 years

Eligibility Home/EU applicants only
1st class honours degree in, or expected to achieve, in Maths, Physics or Engineering

Deadline 6 March 2018

PhD Topic Background/Description
The shape of defects and in particular their local topology, e.g. flaw tip acuity, are known to have a significant impact on the ability of materials to withstand load. Studies on cleavage fracture, ductile initiation and tearing and on the type of fracture mechanism have shown the beneficial effect of defect bluntness. A critical factor for achieving a complete characterisation of bluntness effect of failure is the development of fracture testing guidance for notched specimens.

It has been observed that cleavage fracture and ductile tearing from notch tips is more complex than from fatigue pre-cracked standard specimens. The measurement and definition of initiation and crack growth is not as straightforward for notched specimens, i.e. short cracks have been observed to be in competition on different planes. In addition, minimum thickness requirements specified in fracture toughness testing standards for ensuring high constraint conditions dominate are only applicable to fatigue pre-cracked specimens.

This is an exciting opportunity to work in a highly motivated and vibrant research-intensive group as well as spending time at a leading industrial institute in the field, TWI Ltd. In collaboration with another PhD student, you will be working towards the development of notch fracture mechanics-based testing protocols. Finite element modelling and laboratory experience is desired although not essential. By engaging with this group, you will develop unique skills in structural integrity and damage mechanisms (fracture, fatigue, plastic collapse) in both an academic (UoB) and industrial environment (TWI).
Further Particulars

You will be working as a member of a Solid Mechanics Group, a world-renowned research team in the field of Structural Integrity. You will be working in developing and testing fracture mechanics techniques for non-sharp defects. You are expected to be highly computer literate and able to learn using software such as finite element to simulate your experiments as well as undertaking experimental measurements at our labs.

Candidates interested in fracture mechanics, non-destructive evaluation methods and ‘hands on’ experiments are encouraged to apply. The candidate will be co-supervised by Dr Philippa Moore (TWI) and Dr Nicolas Larrosa (UoB) and will spend 1/3 of his/her time in UoB and 2/3 in TWI.

Candidate Requirements

Good ability in experimental solid mechanics and a grasp of computer coding (e.g. Matlab). Ability and willingness to travel nationally and internationally.

Willingness to conduct the research between the University of Bristol and TWI, Cambridge.

Informal enquiries

For informal enquiries please contact Dr Nicolas Larrosa nicolas.larrosa@bristol.ac.uk
For general enquiries, please email came-pgr@bristol.ac.uk

Application Details

To apply for this studentship submit a PhD application using our online application system [www.bristol.ac.uk/pg-howtoapply]

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Mechanical Engineering Department” and specify the title of the scholarship in the “other” box below with the name of the supervisor.

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