Aquitaine –Karnataka collaboration
Scientific Project for Pre-PhD student exchange

Scientific Proposal

Project Title	**A finite element analysis of stress intensity factors in bending of clamped beams**	
Scientific domain	Fracture Mechanics, Materials Science	
Summary (ca. 10 lines)	It has recently been shown that centre loaded pre-cracked beams subject to clamped ends display stable crack propagation in load control. Unlike normal three-point bending supports, there are no analytical expressions for this geometry. The purpose of the project is to carry out calculations using XFEM on a variety of beam sizes and develop accurate analytical expressions to enable this technique to be used without the need to carry out simulations every time.	
Student profile wished	Some experience in computation. Familiarity with FEM would be nice.	
Supervisor Name	Vikram Jayaram	
Supervisor @ &phone	qjayaram@materials.iisc.ernet.in	Tel:+91-80-2360 1198 +91 96633 68667 (mobile)
Institute/laboratory/industry (full address)	Department of Materials Engineering, Indian Institute of Science, Bangalore 560012	
Director Name Institute/laboratory/industry	Anurag Kumar, Director, Indian Institute of Science	
Director Institute/laboratory/industry @ & phone	diroff@admin.iisc.ernet.in	Tel: +91-80 2293 2222
Timing & duration for project (give approximate ranges)	3-4 months starting this summer. But can be extended to other problems if the candidate is interested (maybe 6 months)	
SelectedPublications	**1. A new method for fracture toughness determination of graded (Pt,Ni)Al bond coats by microbeam bend tests,** Nagamani Jaya B, Vikram Jayaram and Sanjay Kumar Biswas, Phil. Mag. A Volume 92, Issue 25-27, pages 3326-3345 (2012) 2. **Crack stability in edge notched clamped beam specimen under bending: Modeling and experiments,** N. J. Balila and Vikram Jayaram Int. J. Frac. 188:213–228 (2014) **3. Optimisation of clamped beam geometry for fracture toughness testing of micron-scale samples,** BN Jaya and Vikram Jayaram, Phil. Mag. (in press)http://dx.doi.org/10.1080/14786435.2015.1010623	

Contact Aquitaine: Erick Dufourc @: e.dufourc@cbmn.u-bordeaux.fr tél: +33 5 4000 6818	Contact Karnataka: Dipankardas Sarma @: sarma@sscu.iisc.ernet.in tél: +91 80 2293 2945
http://www.cbmn.u-bordeaux.fr/aquitaine-karnataka-exchange?lang=2	

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