Universität Stuttgart

Institut für Mechanik
Prof. (jun.) C. Linder, PhD

Open PhD / Research Assistant Position

Computational Modeling of Phenomena in Dynamic Fracture

Theoretical foundations of solids at failure show notable discrepancies when compared to experimental results due to the crucial role of dynamic instabilities. On the macroscopic scale, dynamic fracture is experienced for example by the presence of *cracks* in brittle materials or *shearbands* in ductile materials. The influence of the different spatial scales becomes apparent when considering effects of dynamic crack microbranching processes on the forming of cracks. In this context, *branching* is understood as the spreading of two or multiple cracks from a single one. The aim of this project is to increase our understanding of the challenging phenomena appearing when solids undergo dynamic fracture through the incorporation of effects from different length scales into the finite element framework, the numerical scheme planned to be employed at the macroscale.

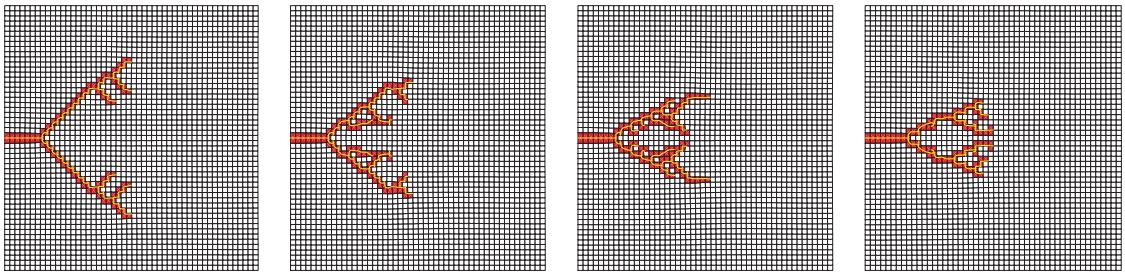

Figure: Crack branching pattern for different crack branching initiation velocities and applied velocities at the bottom and top surface of a rectangular block.

General Remarks:
The prospective PhD student will be part of the "Junior Research Group on Micromechanics of Materials" (`www.mechbau.uni-stuttgart.de/ls1/jrg`) of Prof. (jun.) Christian Linder at the Institute of Applied Mechanics (Chair I) which has recently been established through the "Stuttgart Research Center for Simulation Technology" (SRC SimTech).

The position with the designated salary bracket TV-L 13 has a limited tenure of initially three years with a possible extension by another two years. The PhD student is expected to participate actively in the SimTech Teaching Program (`www.simtech.uni-stuttgart.de`).

Highly motivated and qualified applicants with a diploma or masters degree in engineering, mathematics, or physics are invited. The successful candidate should have a strong background in continuum mechanics as well as knowledge in programming and the finite element method.

Applications with the usual documents (CV, degree certificates, references, publication list, letter of motivation) should be sent directly to Prof. (jun.) Christian Linder (`linder@mechbau.uni-stuttgart.de`), Institute of Applied Mechanics (Chair I), Universität Stuttgart, Pfaffenwaldring 7, 70550 Stuttgart, Germany.