MS5: Dynamic Fracture, Fragmentation and Impact

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Dynamic fracture is an important issue in safety assessment of structures under extreme loading. This mini symposium is aimed towards providing fruitful discussions and exchange of ideas and concepts among different approaches used by researches in the fields of experiments, modeling and simulations. The contributions are welcome in order to discuss different views for the same problems.

In the framework of the workshop a number of not yet well understood fundamental questions should be discussed, for example: Do the dynamic local inertial terms influence the crack birth and how? How do stress waves influence crack propagation paths? How does the strain rate influence material properties, strength and fracture energy? What is the reason behind phenomena of crack branching and change of the failure mode? What is the role of inertia? What is the maximum crack velocity in different materials? What are the limits of fragmentation simulations in terms of fragment size and residual velocities? Does the fracture occur due to plastic exhaustion (tearing) of the material or is the damage the leading term in the fracture of ductile materials?

Furthermore, some technical aspects, experimental and numerical, are of great importance to improve our understanding of different phenomena. For instance: What are the most efficient loading systems for measuring dynamic crack propagation in experiments? How do one measure a dynamically progressing crack? Can one observe the initiation of dynamically loaded crack? What are the problems related to the objective evaluation of experimentally measured data? What are reliable numerical models and approaches used for simulation of materials and structures under dynamic loading: cohesive crack models, X-FEM, EFG or SPH, deletion of finite elements? Are multi-scale modeling approaches reasonable to be used for modeling of dynamic crack propagations?

All contributions from the field of experimental, numerical and theoretical fields of research are welcome. Moreover, presentations on industrial real life applications are also of great interest and are welcome.