Statistical Aspects of Fracture

L. Ponson¹, D. Bonamy², J.-F. Molinari³

¹Université Pierre & Marie Curie, Paris (FRANCE) (laurent.ponson@upmc.fr)
²CEA Saclay, (FRANCE) (daniel.bonamy@cea.fr)
³EPFL Lausanne (SWITZERLAND) (jean-francois.molinari@epfl.ch)

This minisymposium focuses on the statistical aspects inherent to fracture, their implications in terms of predictability and representativeness, the experimental/analysis methods to characterize them, the theoretical & numerical upscaling methods developed to take them into account … The past twenty years have seen the emergence of novel approaches, at the interface between non-linear continuum mechanics and statistical and non-linear physics. It is timely to discuss these recent advances. Applications of this research to material characterization, failure analysis and structural health monitoring are also most welcome. Key topics will include:

1. Predictability in brittle fracture: Statistics of failure strength, material defect characterization, crack initiation, size effects.
5. Scale coupling and emergence of effective failure properties: Theoretical and numerical methods to address multiscale processes, homogenization techniques, stochastics approaches.

Numerical, theoretical and experimental studies are welcome and encouraged.