1015-74-274 **Blaise Bourdin*** (bourdin@math.lsu.edu), Department of Mathematics, Louisiana State University, 344, Lockett Hall, Baton Rouge, LA 70803. *Global minimization for a variational formulation of brittle fracture.*

The talk deals with the numerical implementation of a variational model for the evolution of cracks in a brittle material, proposed by J.-J. Marigo and G.A. Francfort in 1998. This model departs as slightly as feasible from the classical Griffith theory, while curing its main defects, allowing for instance the simultaneous prediction of the cracks path and length, as well as their initiation.

It consists in viewing fracture evolution (in a quasi-static setting) as a time-parameterized set of (non-convex) minimization problems for the sum of the bulk and surface energies. Energy balance must also be satisfied throughout the evolution, as well as the irreversibility of the cracking process.

The numerical implementation of this model involves the global minimization of a serie of large scale non-convex functionals, a challenging task considering the potential presence of many local minimizers.

In this talk, I will present an algorithm allowing to detect and avoid a large class of local minimizers. I will detail its analysis and present some numerical experiments. (Received February 07, 2006)