1023-49-715   **Matteo Negri*** (`matteo.negri@unipv.it`), Dipartimento di Matematica, Universita' di Pavia, Via Ferrata 1, 27100 Pavia, PV, Italy. *Fracture energies as limit of non-local damage energies.*

Beyond the elastic limit most of the engineering materials exhibit dissipative phenomena, such as damage and fracture, in the form of strain localization. Local constitutive models are usually unable to govern these localization effects: in the continuum setting the energies would be neither coercive nor lower-semicontinous in Sobolev spaces while in the discrete setting the finite element solutions would present a wrong energy balance. Different remedies has been employed to bypass these difficulties, e.g. non-local models, fictitious cracks and others, which could be tentatively classified into the so called strong and weak discontinuity classes. Possible connections, differences and coupling seem to be interesting topics both from the computational and mathematical point of view. Taking into account the energies associated with these approaches we show, at least in some simple cases, links and differences between weak and strong models, in the continuum and discrete settings. Our analysis is essentially based on Gamma-convergence and on Special functions of Bounded Deformations. (Received September 21, 2006)