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Incremental Minimization Principles in Fracture and Damage Mechanics

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The formulation of cracks or damage evolution in a body from a principle of minimization of the total energy of the body is an alternative to usual appoaches. To introduce into the model the irreversibility condition of growing of the defects with time a discretization of the problem is first needed. That leads to the notion of incremental evolution problems. This discrete formulation is sometimes sufficient to obtain accurate information on the damaging process. However this bypass is not satisfactory from a conceptual point of view and it is better to pass to the limit when the discretization step goes to zero to obtain the so-called “time-continuous evolution problem. The goal of the conference is to illustrated these different points from several examples chosen in Damage Mechanics, in Griffith Fracture Mechanics and in Barenblatt Fracture Mechanics.

View the extended summary