

**Bonetti, E.; Schimperna, G.**

**Local existence for Frémond's model of damage in elastic materials.** (English) Zbl 1066.74048  
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Summary: We consider a dissipative model recently proposed by M. Frémond to describe the evolution of damage in elastic materials. The corresponding PDEs system consists of an elliptic equation for the displacements with a degenerating elastic coefficient coupled with a variational dissipative inclusion governing the evolution of damage. We prove a local-in-time existence and uniqueness result for an associated initial and boundary value problem, namely considering the evolution in some subinterval where the damage is not complete. The existence result is obtained by a truncation technique combined with suitable a priori estimates. Finally, we give an analogous local-in-time existence and uniqueness result for the case in which we introduce viscosity into the relation for macroscopic displacements such that the macroscopic equilibrium equation is of parabolic type.

**MSC:**

[74R05](#) Brittle damage

[74H20](#) Existence of solutions of dynamical problems in solid mechanics

Cited in **41** Documents

**Keywords:**

[damage](#); [elastic materials](#); [evolution system](#); [variational formulation](#); [dissipative inclusion](#)

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