

On the regularization of a tensorial continuum damage model

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Since the advent of continuum damage mechanics [2] it has developed into an important and active field of continuum mechanics, see e.g. [3, 4]. Progressing degradation of elastic properties will eventually lead to strain softening behaviour, which can result to ill-posedness of the underlying partial differential equation system. In numerical solution the ill-posedness caused by strain softening produces severe mesh size dependency. Several remedies have been proposed to alleviate or remove this deficiency: non-local integral constitutive models, adding spatial gradients, rate-dependency, etc. Research on gradient regularization of elastic damaging models has mostly concentrated on scalar damage approach, see for example [1], and only few papers have been published where tensorial damage models are considered [5, 6]. In this presentation different regularization approaches applied to the tensorial continuum damage model [7] are compared.

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