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**Embedded representation of fracture in concrete with mixed finite elements.** (English)

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Summary: As an alternative to the smeared and discrete crack representations, an embedded representation of fracture for finite element analysis of concrete structures is presented. The three-field Hu-Washizu variational statement is extended to bodies with internal discontinuities. The extended variational statement is then utilized for formulating elements with a discontinuous displacement field. The new elements are capable of modelling different deformation modes of an internal discontinuity at the element level. The satisfactory performance of the embedded crack representation is verified by several case studies on concrete fracture.

**MSC:**

**74S05** Finite element methods applied to problems in solid mechanics

**74R99** Fracture and damage

Cited in **23** Documents

**Keywords:**

smeared crack; discrete crack; three-field Hu-Washizu variational statement; internal discontinuities; discontinuous displacement field

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