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Non-homogeneous displacement jumps in strong embedded discontinuities. (English)

Zbl 1059.74548

Int. J. Solids Struct. 40, No. 21, 5799-5817 (2003).

Summary: Strong discontinuities are embedded in finite elements to describe fracture in quasi-brittle materials. A new numerical formulation is introduced in which the displacement jumps do not need to be homogeneous within each finite element. Both the crack path and the displacement jumps are continuous across element boundaries. This formulation is compared with the discrete approach, in which interface elements are inserted to model the discontinuities, as well as with other embedded discontinuity approaches and with the partition of unity method. Numerical results have been obtained with relatively coarse meshes, which compare well with experimental results and with the results obtained from analyzes with interface elements.

MSC:

74S05 Finite element methods applied to problems in solid mechanics

74R10 Brittle fracture

Cited in **22** Documents

Keywords:

Strong embedded discontinuity; Discrete cracking

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