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Benvenuti, Elena; Ventura, Giulio; Ponara, Nicola; Tralli, Antonio

Variationally consistent eXtended FE model for 3D planar and curved imperfect interfaces. (English) Zbl 1286.74095

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Summary: We propose an eXtended Finite Element Method convergent to the asymptotic solution of a thin interface problem for both planar and curved imperfect interfaces in three dimensions. The main advantage over standard cohesive-zone models is the bulk-mesh size independence. With respect to standard eXtended Finite Element Method, in the proposed procedure, blending and quadrature sub-domains are not required. The focus is on the evaluation of the accuracy of the proposed approach in solving three-dimensional benchmark tests. The numerical results are compared with those available from analytical solutions and spring-like interface models.

MSC:

74S05 Finite element methods applied to problems in solid mechanics
74A50 Structured surfaces and interfaces, coexistent phases

Keywords:

3D; cohesive; interface; XFEM; spring model

Software:

CUBPACK

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