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**Direct determination of SIF and higher order terms of mixed mode cracks by a hybrid crack element.** (English) [Zbl 1187.74246](#)

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Summary: Recently, the authors (Karihaloo and Xiao, 2001a-c) extended the hybrid crack element (HCE) originally introduced by Tong et al. (1973) for evaluating the stress intensity factor (SIF) to calculate directly not only the SIF but also the coefficients of the higher order terms of the crack tip asymptotic field. Extensive studies have proved the versatility and accuracy of the element for pure mode I problems. This study is to show the versatility of the element for mode II and mixed mode cracks. Accuracy of the SIF and coefficients of higher order terms is validated by comparing with the available results in the literature, or results obtained by the boundary collocation method, which is powerful for relatively simple geometries and loading conditions.

**MSC:**

[74S05](#) Finite element methods applied to problems in solid mechanics

[74G70](#) Stress concentrations, singularities in solid mechanics

[74R10](#) Brittle fracture

Cited in 14 Documents

**Keywords:**

crack tip asymptotic field; hybrid crack element (HCE); mixed mode crack; stress intensity factor (SIF);  $T$ -stress

**Full Text:** [DOI](#)