

Some Numerical Applications in Fracture of Materials

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Abstract

In linear elastic fracture mechanics the stress and strain magnification at the crack tip is characterized by stress intensity factors which have been obtained for a large variety of loading and specimen geometries. However, in reality, the stress of course, will not go to infinity at the crack tip if the plastic zone be considered. In this research some realistic specimens which considered the plastic zone will be discussed by using the boundary element method (BEM). The BEM offers important advantages over "domain" type solutions such as finite element method (FEM). One of the most interesting features of the method is the much smaller system of equations and considerable reduction in the data required to run a problem. In addition, since conditions at infinity are incorporated in the boundary integral directly the BEM is also well suited to problems solving with infinite domains such as the center crack problem in infinite media for which classical domain methods are unsuitable. The results will show the potential application of the BEM.

Keyword : Plastic zone