

Antiplane shear mode stress intensity factor for a slightly perturbed circular crack subject to shear load.

ABSTRACT

This paper deals with a slightly perturbed circular crack, Ω in the three dimensional plane. The problem of finding the resulting shear forces can be formulated as a hypersingular integral equation over a considered domain. Conformal mapping is used to transform the integral equation into a similar equation over a circular region, D . By making a suitable representation of hypersingular integral equation, the problem is reduced to solve a system of linear equations. The system is solved numerically for the unknown coefficients, which will later be used in determining the antiplane shear mode stress intensity factor. Comparison of the numerical solutions with the existing asymptotic solutions show a good agreement.

Keyword: Hypersingular integral equation; Conformal mapping; Stress intensity factor.