

## Numerical solutions for cracks in an elastic half plane

### ABSTRACT

The behavior of the stress intensity factor at the tips of cracks subjected to uniaxial tension  $\sigma_{\infty x=p}$  with traction-free boundary condition in half-plane elasticity is investigated. The problem is formulated into singular integral equations with the distribution dislocation function as unknown. In the formulation, we make use of a modified complex potential. Based on the appropriate quadrature formulas together with a suitable choice of collocation points, the singular integral equations are reduced to a system of linear equations for the unknown coefficients. Numerical examples show that the values of the stress intensity factor are influenced by the distance from the cracks to the boundary of the half-plane and the configuration of the cracks.

**Keyword:** Elastic half-plane; Multiple cracks; Singular integral equation; Sine-shaped crack