Good evening everyone,

In Fracture mechanics, weight function for finding out the stress Intensity factors in a homogenous material is defined by Rice (1972) as,

$$h = h(x, a) = \frac{H}{2K_I^1} \frac{\partial u^1}{\partial a} \tag{1}$$

Here, $\mathbf{u}^1$ and K_I^1 are the displacement vector and SIF, respectively, for some reference loading system (1). H is the appropriate elastic modulus defined as,$H = E$ for plane stress and $H = E/(1-\nu^2)$ for plane strain. Here, E is the Young's modulus, and ν the Poisson's ratio. My problem is: what should be the reference axis for defining the displacement field for a finite crack in an infinite body and why??

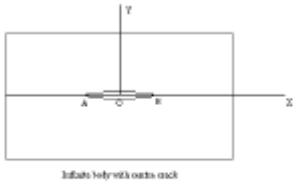

Fig. 1. infinite body with centre crack

My second problem concerns extracting stress intensity factors for following figure subjected to constant temperature How to define stress intensity factors at both the crack tips in terms of Goursat function??

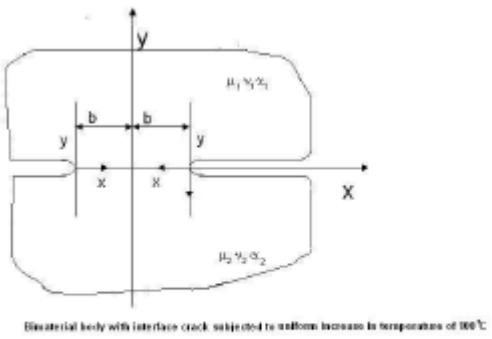

Fig. 2. Semi-infinite bi-material plate subjected to constant uniform temperature load