Stress intensity at propagating ridges

Hugh Harper

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1 See-saw Propagating Ridges

2 Stress Intensity Factor

We evaluate the stress state at propagating ridges by idealizing the ridge as a mode 1 fracture and computing a stress intensity factor. For a finite crack of length a in a plate of thickness H, the mode 1 stress intensity factor K_I is:

$$K_I = \frac{2}{H} \left(\frac{a}{\pi}\right)^{1/2} \int_a \frac{p\left(x\right)}{\left(a^2 - x^2\right)^{1/2}} \, dx \tag{1}$$

where $p(x)$ is the loading function along the length of the crack.

2.1 Previous Approaches

In Phipps Morgan and Parmentier (1985), the loading function $p(x)$ is a simple function of topography along the ridge axis.

2.2 Computing Stress