A Very Very Very Very Veeeeeeeeeeeeeeeeeeeeery Long Title

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Institute of Mathematics and Its Applications

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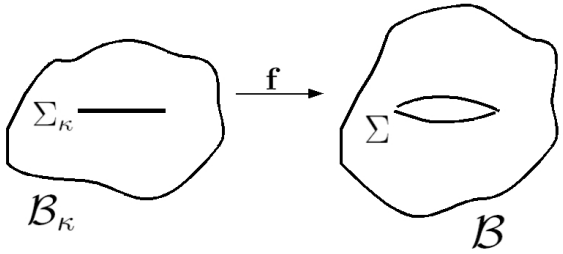
Joint work with Prof. Four, A University

Outline

1. Section One - Title
   - Subsection One - Title
   - Subsection Two - Title
2. Subsection Two - Title

Proposed Approach - Main Features

Consider a classical Griffith crack



- Based on a continuum theory of material behavior
- *Outside the interfacial region:* uses standard constitutive equation for the bulk material behavior
- *Near the crack surfaces:* takes into account effects due to long-range intermolecular forces from adjoining phases

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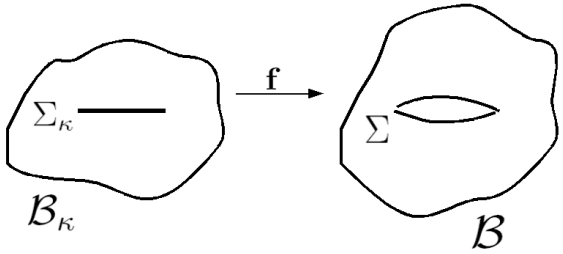

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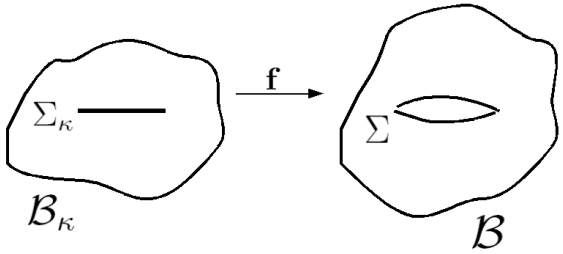

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Classical Model

Predicts:

- a blunt crack tip
- stresses with a square root singularity at the crack tip

Main Equation

If $\gamma \equiv$ const and no mutual body force

$$\frac{\zeta}{\pi}\int_{-1}^{1}\frac{\phi(r)}{x-r}dr = \sigma, \qquad x \in [-1,1]$$

Constant Surface Tension Model

Predicts:

- a sharp opening profile
- stresses with a logarithmic singularity at the crack tip

Main Equation

If $\gamma \equiv$ const and no mutual body force

$$\gamma\phi'(x) + \sigma = \frac{\zeta}{\pi}\int_{-1}^{1}\frac{\phi(r)}{x-r}dr, \qquad x \in [-1,1]$$