Mechanical model

Snowpack deformations, stresses and energy release

\[
\sigma(x), \tau(x) \quad \bar{G}_I(\Delta a), \bar{G}_{II}(\Delta a)
\]

Stress condition
Weak layer overloaded on potential crack length
\[ f(x) \geq 1 \text{ on } \Delta a \]

Energy condition
Energy release of finite crack increment suffices
\[ g(\Delta a) \geq 1 \]

Simultaneous satisfaction
Most critical combination of extra load and admissible crack length

Failure
Critical extra load and size of nucleating crack