Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

The ridge between two fracture tips ROBERT SCHROLL, Departamento de Fisica, Universidad de Santiago, JUAN FRANCISCO FUENTEALBA, Departemento de Fisica, Universidad de Santiago, ENRIQUE CERDA, Departamento de Fisica, Universidad de Santiago — The shape of a fracturing thin sheet is governed by Griffith's criterion, wherein both the system's energy and the applied force are minimized. For a thin sheet adhered to a substrate, the important energies are those of adhesion and bending of the sheet. Without adhesion, the ridge connecting the crack tips need not be developable, and in-plane stretching energy may become important. A reasonable assumption is that this ridge take the shape of a minimal ridge. We present experimental and numerical results that show the shape of this configuration does resemble the minimal ridge. However, an anomalous energy scaling is observed. We also show that the ridge shape, and therefore energy balance, depends on the length of the flap being pulled, which suggests a mechanism for controlling crack shapes.

Robert Schroll
Departamento de Fisica, Universidad de Santiago

Date submitted: 15 Nov 2013 Electronic form version 1.4