

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Static Avalanches in a Random Landscape**<sup>1</sup> A. ALAN MIDDLETON, Syracuse University, PIERRE LE DOUSSAL, KAY J. WIESE, CNRS-LPTENS — We study jumps or avalanches in a model of a  $d$ -dimensional elastic interface that is pinned by disorder and tied to a harmonic spring. The interface configuration is the most stable one, given the disorder and spring position: as the spring is moved, this most stable configuration undergoes discrete jumps or shocks. We carry out numerical simulations to study these shocks and find: (1) detailed qualitative and quantitative verification of the validity of the functional renormalization group analysis of such interfaces and (2) that the distribution of avalanche sizes is numerically consistent with our new calculation of the exact shape of the avalanche distribution, computed in an  $\epsilon = 4 - d$  expansion. The results are quite similar to those seen for dynamic avalanches, where the drive pushes interface configurations between metastable (not globally stable) states.

<sup>1</sup>NSF DMR 0606424 and ANR 05-BLAN-0099-01

A. Alan Middleton  
Syracuse University

Date submitted: 21 Nov 2008

Electronic form version 1.4