

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Slow dynamics of an elastic string in a random potential** ALEJANDRO KOLTON, Université de Genève, DPMC, 24 Quai Ernest Ansermet, CH-1211 Genève 4, Switzerland, ALBERTO ROSSO, LPTMS, Université Paris-Sud F-91405 ORSAY Cedex, France, THIERRY GIAMARCHI, Université de Genève, DPMC, 24 Quai Ernest Ansermet, CH-1211 Genève 4, Switzerland — We study the slow dynamics of an elastic string in a two dimensional pinning landscape by means of Langevin dynamics simulations. We find that the Velocity-Force characteristics are well described by the creep formula predicted from phenomenological scaling arguments. However, at strong disorder, the creep exponent  $\mu$  and the roughness  $\zeta$  of the string display a clear deviation from the values  $\mu \approx 1/4$  and  $\zeta \approx 2/3$  expected assuming a quasi-equilibrium-nucleation picture of the creep motion. We also analyzed the non-stationary relaxation of the string towards the steady state. We identify a slowly growing length  $L(T, F, t)$  separating equilibrated and non-equilibrated length scales during the relaxation. For equilibrated lengths,  $l < L$ , we find a roughness  $\zeta \approx 2/3$  at  $F = 0$  while for small  $F > 0$  an “excess” of roughness  $\zeta > 2/3$  is always observed.

Alejandro Kolton  
Université de Genève, DPMC, 24 Quai Ernest Ansermet  
CH-1211 Genève 4, Switzerland

Date submitted: 04 Dec 2004

Electronic form version 1.4