Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Directed polymers in random media with short-range correlated disorder VIVIEN LECOMTE, LPMA, CNRS et Université Paris Diderot, France, ELISABETH AGORITSAS, THIERRY GIAMARCHI, DPMC, Université de Genève, Suisse — One-dimensional boundary interfaces between different phases are described at macroscopic scales by a rough fluctuating line, whose geometrical properties are dictated by the disorder in the underlying medium, by the temperature of the environment, and by the elastic properties of the line. A widely used and successful model is the directed polymer in a random medium, pertaining to the Kardar-Parisi-Zhang (KPZ) universality class. Much is known for this continuous model when the disorder is uncorrelated, and it has allowed to understand the static and dynamical features of experimental systems ranging from magnetic interfaces to liquid crystals. We show that short-range correlations in the disorder at a scale $\xi > 0$ modify the uncorrelated (i.e. zero ξ) picture in a non-obvious way. If the geometrical fluctuations are still described by the celebrated 2/3 KPZ exponent, characteristic amplitudes are however modified even at scales much larger than ξ, in a well-controlled and rather universal manner. Our results are also relevant to describe the slow (so called 'creep') motion of interfaces in random media, and more formally (trough replicae) one-dimensional gases of bosons interacting with softened delta potential.

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Date submitted: 27 Nov 2012 Electronic form version 1.4