Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Finite size scaling of the dynamical free-energy in the interfacial regime of a kinetically constrained model VIVIEN LECOMTE, Laboratoire Probabilités et Modèles Aléatoires (LPMA), CNRS UMR 7599, Universités Paris 6 et Paris 7, France, THIERRY BODINEAU, DMA, Ecole Normale Supérieure (UMR 8553), 45 rue d'Ulm, Paris, France, CRISTINA TONINELLI, Laboratoire Probabilités et Modèles Aléatoires (LPMA), CNRS UMR 7599, Universités Paris 6 et Paris 7, France — Glassy phenomena have proven difficult to understand: they present a variety of features – slow dynamics, ageing, dynamical heterogeneity, frustration – which make their study arduous from a theoretical point of view. Kinetically Constrained Models (KCMs) are a simple class of lattice gas whose dynamics present features similar to those of glassy phenomena, with the advantage that no disorder is present in the model – making them easier to study. A dynamical approach has been recently proposed: it consists in determining the large deviation function associated to the probability distribution function of time-integrated observables quantifying the "activity" of histories followed by the system. We determine the finite size corrections to the large deviation function of the activity in a KCM (the Fredrickson-Anderson model in one dimension), in the regime of dynamical phase coexistence. Numerical results agree with an effective model where the boundary between active and inactive regions is described by a Brownian interface. We show that the scalings of this physical picture are reflected in the finite size scaling of the dynamical free energy of the model. We expect the same picture to hold in other kinetically constrained models where the particle numberis not conserved.

Vivien Lecomte
Laboratoire Probabilités et Modèles Aléatoires (LPMA),
CNRS UMR 7599, Universités Paris 6 et Paris 7, France

Date submitted: 28 Nov 2011 Electronic form version 1.4