

Depinning in Long-ranged potential

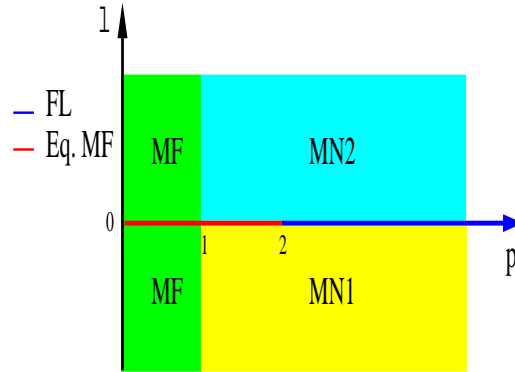
O. Al Hammal¹, Francisco de los Santos¹, Miguel A. Muñoz¹

(1) Departamento de Electromagnetismo y Física de la Materia and Instituto Carlos I de Física Teórica y Computacional, Universidad de Granada, Fuentenueva s/n, 18071 Granada, Spain

We present new results on the depinning transition of bounded Kardar-Parisi-Zhang (KPZ) interfaces. We focus on long-ranged interactions, either attractive or repulsive, in this context, positive and negative KPZ non-linearities lead to physically different pictures. We use the interfacial representation given by a Langevin equation :

$$\partial_t h(\mathbf{x}, t) = \nabla^2 h + \lambda(\nabla h)^2 + a + \frac{b}{h^{p+1}} + \frac{c}{h^{q+1}} + \sigma\eta(\mathbf{x}, t),$$

with $c > 0$ and η a gaussian delta correlated noise. Our results are summarized in the figure below. As already known, the equilibrium case ($\lambda = 0$) exhibits a mean-field (MF) and a fluctuation regime (FL) separated by $p = 2$. In analogy with the equilibrium picture, numerics and analytical arguments for the nonequilibrium counterpart locate in $p = 1$, the boundary between a MF and a *Multiplicative noise* (MN) transition.



[1] H. Hinrichsen, R. Livi, D. Mukamel, and A. Politi, Phys. Rev. Lett. **79**, 2710 (1997). F. de los Santos, M.M. Telo da Gama, and M.A. Muñoz, Europhys. Lett. **57**, 803 (2002).

[3] Work accepted for publication in Phys. Rev. E.