The Slow Bond Random Walk and the Snapping Out Brownian Motion

Tertuliano Franco[1]

[1] UFBA

We consider a continuous time symmetric random walk on the integers, whose rates are equal to 1/2 for all bonds, except for the bond of vertices $\{-1, 0\}$, which associated rate is given by $\alpha n^{-\beta}/2$, where α and β are parameters of the model. We prove here a functional central limit theorem for the random walk with a slow bond: if $\beta < 1$, then it converges to the usual Brownian motion. If $\beta > 1$, then it converges to the reflected Brownian motion. And at the critical value $\beta = 1$, it converges to the snapping out Brownian motion (SNOB) of parameter $\kappa = 2\alpha$, which is a Brownian type-process recently constructed by Lejay (2016). We also provide Berry-Esseen estimates in the dual bounded Lipschitz metric for the weak convergence of one-dimensional distributions, which we believe to be sharp. Talk based on a joint work with D. Erhard and D. Silva.