Subdiffusive scaling limit of the random walk among random traps

Abstract:

To every $x$ in $\mathbb{Z}^d$, we associate a positive real number $\tau_x$. We consider a random walk on $\mathbb{Z}^d$, often called "Bouchaud's trap model", that is reversible for the measure with weights $(\tau_x)$. We assume that the $(\tau_x)$ are i.i.d. random variables. When these random variables are not integrable, the walk is "trapped" on sites where $\tau_x$ is very large. In this case, for $d > 2$, Barlow and Cerny (2010) proved that the random walk converges in law, after a subdiffusive scaling. Their proof is based on a coarse graining procedure, and require very delicate estimates on the transition probabilities. For $d > 4$, I will present an alternative proof of this result, based on the mixing properties of the environment viewed by the particle.