Localization for annealed Brownian motion in a heavy tailed Poissonian potentials

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Consider the d-dimensional Brownian motion in a random potential defined by attaching a non-negative and polynomially decaying potential around Poisson points. We introduce a repulsive interaction between the Brownian path and the Poisson points by weighting the measure by the Feynman-Kac functional. Under the (annealed) weighted measure, it is shown that the Brownian motion tends to localize around the origin and the properly scaled process converges in law to a Ornstein-Uhlenbeck process.