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Discrete Time Random Walks and p -Adic Brownian Motion.

The fundamental solutions to a large class of pseudo differential equations that generalize the formal analogy of the diffusion equation in the real setting to the p -adic setting give rise to p -adic Brownian motion. Although the pseudo differential equations appear only formally related to the diffusion equation, there are some striking similarities between real and p -adic Brownian motion. We show that a p -adic Brownian motion is a limit of a sequence of discrete time random walks on grids in \mathbb{Q}_p . These random walks are similar to the random walks that converge to Brownian motion in the real setting. (Received September 22, 2015)