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Title: Metropolis algorithm and distorted Brownian motion

Abstract: Given a bounded domain D in R^n and a continuous function ρ that is bounded between two positive constants. Consider the following Metropolis Markov chain $X_j, j \geq 1$ on D . At time $j + 1$, pick a point y at random from the ball with radius h centered at X_j . If y is in D and $\rho(y) \geq \rho(x)$, let $X_{j+1} = y$; if y is in D but $\rho(y) < \rho(x)$, flip a coin with head probability $\rho(y)/\rho(x)$ and let $X_{j+1} = y$ if head appears; in all other cases, let $X_{j+1} = X_j$.

We show that after appropriate scaling in time and step h , the Metropolis chain converges weakly to reflecting distorted Brownian motion in D .

Joint work with K. Burdzy and P. Diaconis.