FLUCTUATIONS OF BROWNIAN MOTION WITH DRIFT

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Abstract

Consider 3 dimensional Brownian motion started on the unit sphere \(|x| = 1\) with initial density \(\rho\). Let \(\rho_t\) be the first hitting density on the sphere \(|x| = t + 1\), \(t > 0\). Then the linear operators \(T_t\) defined by \(T_t \rho = \rho_t\) form a semigroup with an infinitesimal generator which is approximately the square root of the Laplacian. This paper studies the analogous situation for Brownian motion with a drift \(b\), where \(b\) is small in a suitable scale invariant norm.

*Research partially supported by the U.S. National Science Foundation under grants DMS 9403399 and DMS 9404197.
**Research supported by NFR - Norges Forskningsråd (Norwegian Research Council) grant 100222/40.