

1135-60-179

Sayan Banerjee (sayan@email.unc.edu), **Maria Gordina** (maria.gordina@uconn.edu) and **Phanuel Mariano*** (phanuel.mariano@uconn.edu). *Coupling in the Heisenberg group and its applications to gradient estimates.*

We construct a non-Markovian coupling for hypoelliptic diffusions which are Brownian motions in the three-dimensional Heisenberg group. We then derive properties of this coupling such as estimates on the coupling rate, and upper and lower bounds on the total variation distance between the laws of the Brownian motions. Finally we use these properties to prove gradient estimates for harmonic functions for the hypoelliptic Laplacian which is the generator of Brownian motion in the Heisenberg group. (Received August 07, 2017)