

SPECTRAL ASYMPTOTICS FOR KINETIC BROWNIAN MOTION ON RIEMANNIAN MANIFOLDS

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The kinetic Brownian motion is a stochastic process that interpolates between the geodesic flow and Laplacian. It is also an analogue of Bismut's hypoelliptic Laplacian operator. I will talk about a simple proof of the convergence of the spectrum of kinetic Brownian motion to the spectrum of base Laplacian for all compact Riemannian manifolds without boundary, which generalizes recent work of Kolb–Weich–Wolf on constant curvature surfaces and is analogous to the theorem of Bismut–Lebeau for hypoelliptic Laplacian. As an application, we prove the optimal convergence rate of kinetic Brownian motion to the equilibrium (given by the spectral gap of the base Laplacian) conjectured by Baudoin–Tardif. This is based on joint work with Qiuyu Ren.