

概率论系列报告

报告题目 (Title): On the Dirichlet form of three-dimensional
Brownian motion conditioned to hit the
origin

报告人 (Speaker): 李利平 博士
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时间 (Time): 11月27日(周一)下午 3:00-4:00

地点 (Venue): 北京大学理科一号楼 1303

摘要 (Abstract): Our concern in this talk is the energy form induced by an eigenfunction of a self-adjoint extension of the restriction of the Laplace operator to $C_c^\infty(\mathbf{R}^3 \setminus \{0\})$. We will prove that this energy form is a regular Dirichlet form with core $C_c^\infty(\mathbf{R}^3)$. The associated diffusion X behaves like a 3-dimensional Brownian motion with a mild radial drift when far from 0 , subject to an ever-stronger push toward 0 near that point. In particular $\{0\}$ is not a polar set with respect to X . The diffusion X is rotation invariant, and admits a skew-product representation before hitting $\{0\}$: its radial part is a diffusion on $(0, \infty)$ and its angular part is a time-changed Brownian motion on the sphere S^2 . The radial part of X is a "reflected" extension of the radial part of X^0 (the part process of X before hitting $\{0\}$). Moreover, X is the unique reflecting extension of X^0 , but X is not a semi-martingale. This is a joint work with Professor Patrick J. Fitzsimmons.

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