

Degenerate reflected diffusions and their stationary distribution.

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Abstract: In this talk, we will start by studying reflected Brownian motion, from the one dimensional case, introducing the concept of local time, to the multidimensional case, interpreting reflection as a way of constraining a diffusion process to a domain $D \subseteq \mathbb{R}^n$. We will inspect three approaches that allow for the construction of reflected diffusions: the submartingale problem, stochastic differential equations, and Dirichlet forms. A key problem for applications is to know as much information as possible about the stationary distribution of these processes. We will explore three related examples that model different situations: Brownian motion versus gravitation, diffusions with inert drift, and spinning Brownian motion.