Speaker Masatoshi Fukushima

Title of Talk I: One dimensional diffusions and their Dirichlet forms

Abstract: The one dimensional diffusion X^0 on an interval I with absorbing boundary condition is symmetric with respect to its speed measure m. We first exhbit its $L^2(I;m)$-Dirichlet form, its extended Dirichlet space and its reflected Dirichlet space.

Next we show that, if the left boundary a is regular for X^0, then the α-order approaching probability to a is m-integrable on I regardless the behavior of X^0 near the right boundary, based on Chapter 5 of a recently published book:

K. Itô, Essentials of Stochastic Processes, Translation of Math. Monograph, AMS, 2006.

We also explain the non-uniqueness of the regular Dirichlet subspace of the active reflected Dirichlet space based on

X. Fang, M. Fukushima and J. Ying, On regular Dirichlet subspaces of $H^1(I)$ and asociated linear diffusions, *Osaka J. Math.* **42** (2005), 27-41.

Title of Talk II: Flux of a function at a closed set for the one dimensional diffusion and multidimensional Brownian motion

Abstract

Given a symmetric Markov process X on a state space E and a closed set $K \subset E$ such that either K is compact or $E \setminus K$ is compact, the notion of the *flux* of a function at K is readily defined by using the reflected Dirichlet space of the absorbed process X^0. We show its coincidence with the classical notion of flux in the next two cases:

- X is the reflected diffusion on $[0, \infty)$ and $K = \{0\}$
- X is the multidimensional Brownian motion and ∂K is compact and smooth.