ON THE POTENTIAL THEORY OF JUMP PROCESSES IN OPEN SETS

ZORAN VONDRAČEK

Consider a β-stable process in the Euclidean space $\mathbb{R}^d$, $0 < \beta \leq 2$, which is killed upon exiting an open subset D. The killed process is then subordinated via an independent γ-stable subordinator. The resulting process Y^D is called a subordinate killed stable process. In two recent papers, it has been shown that the potential theory of this process exhibits some interesting features. The first one is the form of the jumping kernel which depends on the distance of points to the boundary in a novel way. The second and unexpected feature is the fact that for some values of the stability index γ, the boundary Harnack principle fails.

In the first part of the talk, I will review these results. The second part of the talk will be devoted to ongoing work on potential theory of jump processes in open subset D of $\mathbb{R}^d$ defined through their jumping kernels that depend not only on the distance between two points, but also on the distance of each point to the boundary ∂D of the state space D.

Joint work with Panki Kim and Renming Song.