LOCAL PROBABILITIES FOR ASYMPTOTICALLY STABLE RANDOM WALKS IN HALF SPACE

Denisov Denis

✧ *Email: denis.denisov@manchester.ac.uk; University of Manchester, Manchester, UK.*

We consider an asymptotically stable multidimensional random walk $S(n) = (S_1(n), \ldots, S_d(n))$. Let $\tau_x := \min\{n > 0 : x_1 + S_1(n) \leq 0\}$ be the first time the random walk $x + S(n)$ leaves the upper half-space. We study the asymptotics of $p_n(x, y) := \mathbb{P}(x + S(n) \in y + \Delta, \tau_x > n)$ as n tends to infinity, where Δ is a fixed cube. We obtain exact asymptotics in the regime of normal and small deviations and obtain accurate bounds in the regime of large deviations. From that we obtain the local asymptotics for the Green function of $G(x, y) := \sum_n p_n(x, y)$, as $|y|$ and/or $|x|$ tend to infinity. This is joint work with V. Wachtel.