Universität Ulm | 89069 Ulm | Germany

ulm university universität
uulm

**Fakultät für Mathematik und
Wirtschaftswissenschaften**
Institut für Stochastik

Prof. Dr. Evgeny Spodarev

Helmholtzstraße 18
89081 Ulm, Germany

Tel: +49 731 50-23530
Fax: +49 731 50-23649
evgeny.spodarev@uni-ulm.de
http://www.uni-ulm.de/stochastik/

5. Oktober 2012

Einladung zum Vortrag

von

Frau Dr. Ekaterina Bulinskaya
LOMONOSOV MOSCOW STATE UNIVERSITY

Limit Distributions of Particles Numbers in Catalytic Branching Random Walk

Branching random walk (BRW) can be considered as a generalization of both branching process and random walk. There are a lot of different models of BRW specified by various kinds of branching and walking as well as their relationship. Such processes find applications in population dynamics, statistical physics, chemical kinetics and other research fields.

We concentrate on the model of catalytic branching random walk (CBRW) on integer lattice Z^d proposed by V.A.Vatutin, V.A.Topchii and E.B.Yarovaya in 2003. Its main feature consists in a single source of branching located w.l.g. at the origin where individuals (particles) may produce offsprings. Outside the source of branching particles may perform random walk only. As many kinds of branching processes, CBRW can be classified as supercritical, critical or subcritical depending on the relation between some parameters of the model.

It should be noted that recently the analysis of limit distributions of total and local particles numbers has been completed for supercritical, critical and subcritical CBRW on Z^d for each $d \in \mathbb{N}$. Thus, we are going to give the overview of those limit distributions and then focus on our results concerning critical and subcritical CBRW. As usual, critical case is the most interesting since in asymptotic behavior of total and local numbers there arise unexpected patterns depending essentially on d.

To prove our results we employ both analytic and probabilistic methods. Namely, among them there are the technique of differential equations in Banach spaces and spectral theory, Laplace transform and Tauberian theorems, construction of an auxiliary Bellman-Harris branching process with several types of particles, renewal theory and others. We also have to introduce a new notion "hitting time with taboo`` in the framework of (non-branching) random walk on Z^d and study its properties for each d.

Termin: Dienstag, 6. November 2012, 14 Uhr ct.

Ort: Universität Ulm, Helmholtzstr. 18, Raum 220

Interessenten sind herzlich eingeladen.
Der Vortrag findet im Rahmen unseres Forschungsseminars statt.

gez. E. Spodarev