U vremenu od 24. do 31. maja ove godine gost našeg Fakulteta biće

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Tokom boravka u Beogradu profesor Samorodnitsky će održati sledeća tri predavanja (datumi i vreme predavanja biće naknadno istaknuti):

1. Geometric characteristics of the excursion sets over highl levels of non-Gaussian infinitely divisible random fields

(jointly with R. Adler and J. Taylor)

Abstract: We consider smooth infinitely disivible random fields of the type $\big(X(\beta),\, \beta \in [-1,1]^d\big)$, with regularily varying Lévy measure. For such random fields we are interested in the geometric characteristics of the excursion sets

$$A_u = \big\{\beta \in [-1,1]^d : X(\beta) > u\big\}$$

over high level u.

For a large class of random fields we compute the asymmtotic (as $u \to \infty$), conditional on A_u being non-empty) joint distribution of the of the numbers of critical points over the level u of all types. This allows us, for example, to obtain the asymptotic conditional distribution of the Euler characteristic of the excursion set. In a significant departure from the Gaussian situation, the excursion set over a high level for smooth random fields we are considering, can have complicated geometry. In the Gaussian case the excursion set, unless it is empty, is nearly certain to be "a ball-like" and have its Euler characteristic equal to one. In contrast, the Euler characteristic of the excursion sets in our model can have a highly non-degenerate conditional distribution.

2. Large deviations for point processes based on stationary sequences with heavy tails (jointly with Henrik Hult)

Abstract: In many applications involving functional large deviations for partial sums of stationary, but not iid, processes with heavy tails, a curious phenomenon arises: closely grouped together large jumps coalesce together in the limit, leading to loss of information of the order in which these jumps arrive. In particular, many functionals of interest become discontinuous. To overcome this problem we move from the functional large deviations to the point-process-level large deviations. We develop the appropriate topological framework and prove large deviations theorems for point processes based on stationary sequences with heavy tails. These results are useful in many situations where functional large deviations are not.

3. Inverse problems for regular variation, linear filters, functional equations and a cancellation property for σ-finite measures

Joint work with Martin Jacobsen, Thomas Mikosch and Jan Rosiński

Abstract: We study a group of related problems: the extent to which presence of regular variation of the tail of certain σ-finite measures at the output of a linear filter determines the corresponding regular variation of a measure at the input to the filter. This turns out to be related to presence of a particular cancellation property in σ-finite measures, which, in turn, is related to uniqueness of solutions of certain functional equations. The techniques we develop are applied to weighted sums of iid random variables, to products of independent random variables, and to stochastic integrals with respect to Lévy motions.