Stochastic geometry, stochastic analysis and spatial statistics

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The beginning of research in stochastic geometry at the Faculty goes back to the nineties, while in stochastic analysis to the seventies (Petr Mandl) of the 20th century. Since those days parallel seminars in these fields take place.

Since 2019, the standard project „New approaches to modeling and statistics of random sets“ is funded by GAČR and headed by Lev Klebanov . The three year international German-Czech project „Parametric representation and stochastic 3D modeling of grain microstructures in polycrystalline materials using random marked tessellations“ (Viktor Beneš , since 2017) presents cooperation between mathematicians and physicists from both countries, based on stochastic geometry. In both projects Zbyněk Pawlas takes part as an expert in spatial modeling and statistics. As a theoretical basis for stochastic geometry, formulas of integral geometry are investigated and extended far beyond the classical smooth setting (Jan Rataj , standard project GAČR „Generalized convexity in geometry and analysis“, since 2018). Bohdan Maslowski is working in the field of stochastic evolution equations and stochastic control theory. Since 2019 the standard project „Stochastic evolution equations and space-time systems", funded by GAČR is being solved together with ÚTIA AVČR.

Selected outputs

- P. Čoupek and B. Maslowski (2017): Stochastic Evolution Equations with Volterra noise , Stoch. Proc. Appl., 127, 877-900.
- B. Kriesche, A. Koubek, Z. Pawlas, V. Beneš, R. Hess, V. Schmidt (2017): On the computation of area probabilities based on a spatial stochastic model for precipitation cells and precipitation amounts , Stoch. Env. Res. Risk Asses., 31, 2659-2674.
- D. Shalymov, O. Granichin, L. Klebanov, Z. Volkovich (2016): Literary writing style recognition via a minimum spanning tree-based approach , Expert Syst. Appl., 61, 145-153.
- J.H.G. Fu, D. Pokorný, J. Rataj (2017): Kinematic formulas for sets defined by differences of convex functions , Adv. Math. 311, 796-832.
- M. Neumann, C. Hirsch, J. Staněk, V. Beneš, V. Schmidt (2019): Estimation of geodesic tortuosity and constrictivity in stationary random closed sets , Scand. J. Statist. 46, doi.org/10.1111/sjos.12375, in print.