Besov-Orlicz path regularity of stochastic processes

Petr Čoupek, Martin Ondreját

The talk will be devoted to Besov-Orlicz regularity of sample paths of, possibly non-Gaussian, stochastic processes. The attention will be paid to processes that are represented by multiple Wiener-Itô integrals of order $n \in \mathbb{N}$ with Hölder continuous kernels of order $\alpha \in (0,1)$. We will give sufficient conditions for such processes to have paths in the exponential Besov-Orlicz space

$$B^{\alpha}_{\Phi_{2/n},\infty}(0,T) \qquad \text{with} \qquad \Phi_{2/n}(x) \sim \mathrm{e}^{x^{2/n}} - 1.$$

These results provide an extension of what is known for scalar Gaussian processes (such as fractional Brownian motions) to stochastic processes in an arbitrary finite Wiener chaos (such as Rosenblatt or higher-order fractionally filtered Hermite processes).

References

[1] P. Čoupek, M. Ondreját, *Besov-Orlicz path regularity of non-Gaussian processes*, Potential Analysis 60, 307–339 (2024)

First Author: Petr Čoupek
Affiliation: *Charles University*
Faculty of Mathematics and Physics
Sokolovská 83, 186 75, Prague 8, Czech Republic
e-mail: coupek@karlin.mff.cuni.cz

Second Author: Martin Ondreját
Affiliation: *Czech Academy of Sciences*
Institute of Information Theory and Automation
Pod Vodárenskou věží 4, 182 00, Prague 8, Czech Republic
e-mail: ondrejat@utia.cas.cz