Barbu V. S., Beltaief S., Pergamenshchikov, S. (LMRS, University of Rouen Normandy, France) — **Oracle inequalities and robust adaptive efficient estimation for continuous time semi-Markov regression models from continuous or discrete data.**

In this presentation we consider the nonparametric robust estimation problem for regression models in continuous time with semi-Markov noises. The model introduced in [1] and studied in [1] and [2] is described by

$$\mathrm{d}\, y_t = S(t)\mathrm{d}\, t + \mathrm{d}\, \xi_t\,, \quad 0 \le t \le n\,, \tag{1}$$

where $S(\cdot)$ is an unknown 1-periodic function defined on $\mathbb{R}$ with values on $\mathbb{R}$, $(\xi_t)_{t\ge 0}$ is the unobserved noise process $\xi_t = \varrho_1 L_t + \varrho_2 z_t$, where ϱ_1 and ϱ_2 are unknown coefficients, $(L_t)_{t\ge 0}$ is a Lévy process and $(z_t)_{t\ge 0}$ is a particular case of a semi-Markov process [3].

Our problem is to estimate the unknown function S in the model (1) on the basis of: (i) continuous observations $(y_t)_{0\le t\le n}$, cf. [1]; (ii) discrete observations $(y_{t_j})_{0\le j\le np}$, $t_j = j\Delta$, $\Delta = \frac{1}{p}$,where the integer $p \ge 1$ is the observation frequency, cf. [2].

In both cases, we construct a family of estimators for S based on the model selection procedure proposed by Konev and Pergamenshchikov (2012) and we choose the best possible one by minimizing a cost function. Under quite general moment conditions on the noise distribution, non-asymptotic oracle inequalities for the risks are obtained. These inequalities represent the starting point for investigating the efficiency of the estimators.

REFERENCES

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