Zorine A. V. (Lobachevsky State University of Nizhni Novgorod, Nizhni Novgorod, Russia), **About parameter estimation from a partially observed marked Poisson point process with censored marks** Let $\Theta \subset \mathbb{R}^k$ be a parameter set with an element θ. Let Φ be a marked Poisson point process in a measurable space $([0, T_0 + T_1] \times \mathbb{R}_+,\ \mathcal{B}([0, T_0 + T_1]) \otimes \mathcal{B}(\mathbb{R}_+))$ with independent marking, a compensator function $\Lambda(t;\theta) = \int_0^t \lambda(s;\theta)\, ds$ (cf. [1]), where $T_0 > 0$, $T_1 > 0$ are given constants. A mark of a point $t \in [0, T_0 + T_1]$ in the Poisson point process has a probability distribution function $F(u; t, \theta) = \int_0^t f(s; t, \theta)\, ds$. For an arbitrary counting measure $\varphi(\cdot)$ on $([0, T_0 + T_1] \times \mathbb{R}_+,\ \mathcal{B}([0, T_0 + T_1]) \otimes \mathcal{B}(\mathbb{R}_+))$, define an operator $\mathfrak{S}$ as follows: a counting mesure $\psi(\cdot) = \mathfrak{S}(\varphi(\cdot))$ on a measurable space $(X, \mathfrak{X}) = ([0, T_0 + T_1] \times \mathbb{R}_+ \times \{0, 1\},\ \mathcal{B}([0, T_0 + T_1]) \otimes \mathcal{B}(\mathbb{R}_+) \otimes 2^{\{0,1\}})$ has an atom (t, x, z) if and only if either $z = 0$, $T_0 \leqslant t + x \leqslant T_0 + T_1$ and $\varphi(\{(t, x)\}) > 0$, or $z = 1$, $t + x = T_0 + T_1$ and there exists an $s > x$, such that $\varphi(\{(t, s)\}) > 0$. Let's consider a new marked point process $\Psi = \mathfrak{S}(\Phi)$. Denote by $Q_\theta(\cdot)$ its probability distribution.

Theorem 1. *Let $\psi_0(\cdot)$ be a counting measure on $(X, \mathfrak{X})$ with atoms (t_i, x_i, z_i), $i = 1, 2, \ldots, n$, $n < \infty$, $\tilde{L}(\psi_0; \theta) = \prod_{i=1}^{n} \Big[\lambda(t_i; \theta)\big(f(x_i; \theta, t_i)\big)^{1-z_i}\big(1 - F(x_i; \theta, t_i)\big)^{z_i}\Big] \times$ $\times \exp\Big\{-\int_0^{T_0} \lambda(u; \theta)(1 - F(u; \theta, t))\, du - (\Lambda(T_1 + T_0) - \Lambda(T_0))\Big\}$. Then the Radon–Nikodym derivative $dQ_\theta/dQ_{\theta_0}(\psi_0)$ is given by $\tilde{L}(\psi_0; \theta)/\tilde{L}(\psi_0; \theta_0)$.*

Theorem 1 allows to apply the maximum likelihood to estimater the parameter θ.

REFERENCES

[1] Franken P. et al. *Queues and point processes.* Berlin: John Wiley & Sons. 1982. 284 p.