

Vasiliev V. A. (Tomsk, Russia) — **Optimal parameter estimation of an autoregression by observations with additive noise.**

Consider the estimation problem of the parameter λ of a scalar autoregressive process $(x_n)_{n \geq 0}$ satisfying the equation

$$x_n = \lambda x_{n-1} + \xi_n, \quad n \geq 1 \quad (1)$$

by observations

$$y_n = x_n + \eta_n, \quad n \geq 0.$$

Process (1) is supposed to be stable, i.e. $|\lambda| < 1$. Processes (ξ_n) , (η_n) and x_0 are mutually independent; noises ξ_n and η_n form sequences of i.i.d.r.v. and the variance of the noise in observations $E\eta_0^2$ is unknown. On the basis of the truncated estimation method [1] there are constructed estimators λ_n of parameter λ , which are optimal in the sense of the criterion

$$R_n = AE(\lambda_n - \lambda)^2 + n \rightarrow \min_n.$$

Parameter A stands for a cost of mean square quality of the estimator of parameter λ . Asymptotic properties of optimal sample size and risk function R_n value as $A \rightarrow \infty$ are investigated. Optimization problems in the sense of the risk function of a similar structure were considered first in the book [2] and references therein.

REFERENCES

1. *Vasiliev V.A.* A Truncated Estimation Method with Guaranteed Accuracy. Ann. of Inst. of Stat. Math., 2014, vol. 66, pp. 141-163.
2. *Chernoff H.* Sequential Analysis and Optimal Design //Regional conference series in applied mathematics of SIAM, Philadelphia, 1972.

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