

Some results on identification of partially observed systems

Vladimir Zaiats, Universitat de Vic

(joint work with Yury Kutoyants)

Abstract

We consider several problems of nonparametric estimation related to the following partially observed linear system

$$\begin{aligned}dX_t &= h_t Y_t dt + \varepsilon dW_t, & X_0 &= 0, & 0 \leq t \leq T, \\dY_t &= g_t Y_t dt + \varepsilon dV_t, & Y_0 &= y_0 \neq 0\end{aligned}$$

in the asymptotics of small noise ($\varepsilon \rightarrow 0$). Here W_t and V_t are independent Wiener processes and the observed component is $X = (X_t, 0 \leq t \leq T)$. We suppose that the functions h_t or g_t are unknown and study the properties of kernel-type estimators of these function (separately). We show the consistency of these estimators and the asymptotic optimality of the rate of convergence.