

Parameter estimation for stationary solutions of stochastic delay equations

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Assume that we observe a continuous realization of a stationary solution to the affine stochastic delay differential equation

$$dX(t) = \int_{[-r,0]} X(t+u) a_{\vartheta}(du) dt + dW(t), \quad t \geq 0,$$

with the initial condition $X(t) = X_0(t)$, $t \in [-r, 0]$, independent of the standard Wiener process W ; here $\vartheta \in \Theta \subset \mathbb{R}^k$ and a_{ϑ} are signed measures. We are interested in asymptotic inference about the parameter ϑ as the duration of observations $T \rightarrow \infty$. Under certain assumptions we provide a general form of the limiting log-likelihood ratio which is connected with the rate of convergence. More detailed results are presented in a specific model.

The talk is based on a joint work with Uwe Küchler.