

**Parameter estimation in second-order continuous time Gaussian autoregressions.**

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**Abstract**

For the one-dimensional Ornstein-Uhlenbeck process, asymptotic behavior of the maximum likelihood estimator (MLE) of the drift depends on the sign of the unknown parameter, and there are three different distributions possible in the limit. The objective of the talk is to discuss a similar problem when the corresponding deterministic equation is second-order in time and there are two parameters to estimate. In this case, the asymptotic behavior of the MLE depends on the roots of the corresponding characteristic equation. All in all, there are nine cases to consider, and some of the results are rather unexpected.