

Sharp large deviations for the non-stationary Ornstein-Uhlenbeck process

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Abstract

For the Ornstein-Uhlenbeck process, the asymptotic behavior of the maximum likelihood estimator of the drift parameter is totally different in the stable, unstable, and explosive cases. Notwithstanding of this trichotomy, we establish sharp large deviation principles for this estimator in the three situations. In the explosive case, we exhibit a very unusual rate function with a shaped flat valley and an abrupt discontinuity point at its minimum.