

Mininni, Rosa Maria; Romanelli, Silvia

Martingale estimating functions for Feller diffusion processes generated by degenerate elliptic operators. (English) [Zbl 1082.47036](#)

J. Concr. Appl. Math. 1, No. 3, 191-216 (2003).

The authors study a nonergodic diffusion process $X = (X_t)_{t \geq 0}$ taking values in $[0, +\infty)$ which is a weak solution of the SDE

$$dX_t = \theta X_t dt + \sqrt{2}X_t dW_t, \quad X_0 = x_0,$$

with parameter $\theta \in \mathbb{R}$. The associated (analytic) Feller semigroup on $C[0, +\infty]$ has generator A_θ , $D(A_\theta) = \{u \in C[0, +\infty] \cap C^2(0, +\infty); A_\theta u := x^2 u'' + \theta x u' \rightarrow 0 \text{ as } x \rightarrow 0 \text{ or } x \rightarrow \infty\}$, a case not considered in [*S. Karlin and H. M. Taylor*, "A second course in stochastic processes" (Academic Press, New York etc.) (1981; [Zbl 0469.60001](#))]. To construct optimal estimators for θ based on discrete observations of X , the methods proposed by *M. Sørensen* and coauthors in [*Bernoulli* 1, 17-39 (1995; [Zbl 0830.62075](#))] and [*ibid.* 5, 299-314 (1999; [Zbl 0980.62074](#))] are applied and compared. The estimators obtained are asymptotically normal and consistent, their behaviour is illustrated by simulation.

Reviewer: [Andrej V. Bulinski \(Moskva\)](#)

MSC:

[47D07](#) Markov semigroups and applications to diffusion processes

[60J60](#) Diffusion processes

[60G44](#) Martingales with continuous parameter

[62M05](#) Markov processes: estimation; hidden Markov models

Cited in 1 Document

Keywords:

diffusion process; martingale estimating function; analytic Feller semigroup; Wentzell boundary conditions