

ROBUST M -ESTIMATORS IN DIFFUSION PROCESSES

NAKAHIRO YOSHIDA

*Department of Applied Mathematics, Faculty of Engineering Science, Osaka University,
Toyonaka, Osaka 560, Japan*

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Abstract. Methods of robust estimation in diffusion processes are given by means of M -estimation. It is shown that the asymptotic variance of an M -estimator is obtained by applying a certain integral operator to the influence function and integrating its square. Under the condition of boundedness of the influence function, the existence of an optimal robust M -estimator is shown and an approximately optimal practical method is given. Moreover, as another criterion of robustness we consider a norm of integral type and show that the corresponding optimal robust M -estimator is obtained by solving a boundary value problem of a second order differential equation. Finally, as an illustrative example the Ornstein-Uhlenbeck process is discussed.

Key words and phrases: Diffusion process, M -estimator, influence function, Sobolev space, second order differential equation.