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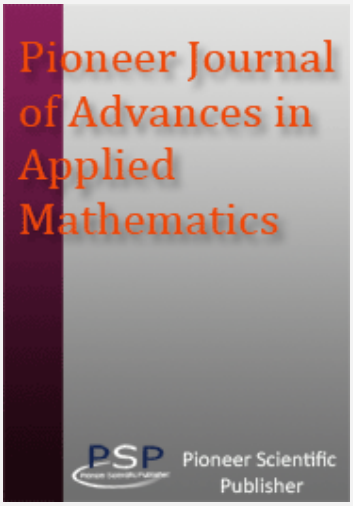

A FINITE ALGEBRAIC LAW OF ITERATED LOGARITHM FOR ITÔ INTEGRALS AND ITS ERROR ESTIMATE

Kazuo Amano

Abstract

We give a discrete version of law of iterated logarithm for indefinite Itô integrals (see [K. Itô and H. P. McKean, Diffusion Processes and Their Sample Paths, Springer-Verlag, Berlin, 1965] and Theorem 4.1) and estimate its discretization error and probability explicitly by simply using brute force computation (Lemmas 3.1 and 3.2). Our result may enable to find an answer to how we can implement numerical stochastic differentiation and make a volatility recovery (see Section 4, [K. Amano, A method of numerical stochastic differentiation for diffusion processes, (in preparation).] and [I. Bouchouev, V. Isakov and N. Valdivia, Recovery of volatility coefficient by linearization, Quantitative Finance 2 (2002), 257-263]).

Keywords and phrases: Brownian motion, law of iterated logarithm, numerical stochastic differentiation.