Stricker, C.

Approximation du crochet de certaines semimartingales continues. (French) Zbl 0539.60045

Sémin. probabilités XVIII, 1982/83, Proc., Lect. Notes Math. 1059, 144-147 (1984).

[For the entire collection see Zbl 0527.00020.]

It is known that if X is an L^2-semimartingale on a complete right continuous stochastic basis $(\Omega,\mathcal{F},P,(\mathcal{F}_t)_{0\leq t\leq 1})$ then $\sum_\sigma E((X_{t_{i+1}}-X_{t_i})^2|F_{t_i}|)$ tends to $<X,X>_t$ in L^1 if the norm of the division $\sigma(0=t_0<t_1<\dots<t_n=t)$ converges to 0. The author gives the following technical generalization of this fact:

Theorem. Suppose that $X_t=W_t+\int_0^t H_s ds$ where W is a Wiener process and H an L^2-bounded predictable process. Suppose also that there exists another L^2-bounded predictable process H' such that $\epsilon_s(t)=E[((W_s-W_t)(s-t)^{-1}(H_s-H_t-H'_t(W_s-W_t))|\mathcal{F}_t]$ uniformly tends to 0 in L^1 when s converges to t. Then

$$L^1-\lim_n (n/u)(\sum_{i=0}^{n-1} E[(X_{u(i+1)/n}-X_{ui/n})^2|\mathcal{F}_{ui/n}])=\int_0^u H_s^2 ds+\int_0^u H'_s ds.$$

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