

Balkema, A. A.; Chung, K. L.

Paul Lévy's way to his local time. (English) Zbl 0748.60066

Stochastic processes, Proc. Semin., Vancouver/Can. 1990, Prog. Probab. 24, 5-14 (1991).

[For the entire collection see [Zbl 0716.00012](#).]

The paper contains an exposition of Lévy's approach to local time layed down in a paper in 1939. As Chung explains in his foreward the reason for writing this exposition was his impression that very few people have read (resp. understood) Lévy's original ideas.

The authors give proofs for the following assertions: Let B be a Brownian motion. The number of excursion intervals of length $> c$ contained in $[0, t]$ suitably normalized converges (as $c \searrow 0$) a.s. to some process $L^*(t)$. This process coincides with the a.s. limit $L(t)$ of the occupation times $L_\varepsilon(t)$ of B in $]0, \varepsilon[$ up to time t normalized by ε . L is Lévy's local time.

The arguments are based on computations involving the maximum process M associated with B and yield, in particular, that $(M - B, M)$ and $(|B|, L^*)$ are equal in distribution, or as a consequence, B and $|B| - L^*$.

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MSC:

[60J55](#) Local time and additive functionals

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