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# MÉTHODES DE CHANGEMENT DE TEMPS POUR LA CONVERGENCE EN LOI DES MARTINGALES

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*Abstract:* Let $M = (M(t); t \in T)$ be a centred, square integrable martingale, indexed by $T = N$ or $T = R_+$, whose predictible quadratic variation is denoted by $(\langle M\rangle(t); t \in T)$. The main problem we investigate is the study of the joint convergence in law, when $\lambda \to \infty$, of the processes

$$\left(\frac{1}{\sqrt{v(\lambda)}} M \circ \tau(\lambda t), \frac{1}{v(\lambda)} \langle M\rangle \circ \tau(\lambda t); t \geq 0\right),$$

where $v$ and $\tau$ are two increasing functions. To solve this problem we use three technical tools (each of them having its one interest):

- a limit theorem for composed processes;
- a limit theorem for random change of time;
- a method of enlarging the probability space on which $M$ is defined.

This approach looks to be efficient as far as the asymptotic behaviour of functionals of recurrent Markov or semi-Markov processes is concerned. Several examples illustrate the developed theory.

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