



ID de Contribution: 7

Type: **Non spécifié**

## On the Martingale Property of Local Martingales: When a Local Martingale is a True Martingale?

*mardi 1 décembre 2015 10:00 (40 minutes)*

For many problems in the theory of stochastic processes and its applications it is of great importance to know effective criteria ensuring that a given local martingale is a true martingale or even a uniformly integrable martingale. This question is closely related to absolute continuity of probability measures and change of measure and has been the subject of research over many decades. Starting from an arbitrary nonnegative local martingale, the aim of the present talk is to give necessary and sufficient conditions in terms of another but intrinsic probability which is locally equivalent to the given one. The results and the verifiability of the conditions will be illustrated by several applications. First we shall consider a geometric Ornstein-Uhlenbeck financial market. Then we pass on to general stochastic exponentials of continuous local martingales and it will be demonstrated that Novikov's and Kazamaki's conditions are simple consequences of ours. Special examples are discussed for stochastic exponentials of solutions of one-dimensional SDEs without drift in which case purely analytical criteria in terms of the diffusion coefficient are obtained. In particular, if these criteria are not satisfied, then the corresponding process is a strict local martingale which is also referred to as a bubble in the mathematical finance literature.

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