On Numerical Calculations of Stochastic Integrals

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The majority of numerical methods for calculation of stochastic integrals and stochastic differential equations (SDEs) are well-known to have both systematic and random errors [1]. There’s been a number of research works that are focused on systematic error reduction [2]. This paper considers a method that estimates Ito and Stratonovich integrals using Monte Carlo methods that have virtually no systematic error [3]. These methods may also be used for the numerical solution of SDEs: linear and polynomial. For the more general case of SDE local polynomial approximation is possible. Various numerical examples are given. The aforementioned methods are believed to extend to integrals over a martingale which could be of importance when dealing with problems in applied finance.

**References**

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