"Quasi-Monte Carlo Methods in Numerical Finance"

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This paper introduces and illustrates a new version of the Monte Carlo method that has attractive properties for the numerical valuation of derivatives. The traditional Monte Carlo method has proven to be a powerful and flexible tool for many types of derivatives calculations. Under the conventional approach pseudo-random numbers are used to evaluate the expression of interest. Unfortunately, the use of pseudo-random numbers yields an error bound that is probabilistic which can be a disadvantage.

Another drawback of the standard approach is that many simulations may be required to obtain a high level of accuracy. There are several ways to improve the convergence of the standard method. This paper suggests a new approach which promises to be very useful for applications in finance. Quasi-Monte Carlo methods use sequences that are deterministic instead of random. These sequences improve convergence and give rise to deterministic error bounds. The method is explained and illustrated with several examples.These examples include complex derivatives such as basket options, Asian options.