عنوان مقاله:

New Adaptive Monte Carlo Algorithm and Application to Financial Mathematics

محل انتشار:

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خلاصه مقاله:

In this paper, a new adaptive Monte Carlo algorithm is proposed to solve linear systems. Theproposed algorithm converges much faster than the conventional Monte Carlo algorithm. Thecorresponding properties of the algorithm are discussed. It has simple structure, low cost,desirable speed and accuracy.Theoretical results are established to justify the convergence ofthe algorithm. To con¯rm the accuracy and e±ciency of the proposed algorithm, it is usedto solve large linear systems. From the numerical results, the new adaptive Monte Carloalgorithm achieves exponential convergence. Both (the new and the old) adaptive MonteCarlo algorithms are implemented for parallel solution of large linear systems on parallelmachine with MPI as inter node communication. Furthermore, we provide an applicationof the algorithm to price options, where the Black Scholes formula is converted to linearsystems using discretization.

کلمات کلیدی:

Adaptive Monte Carlo algorithm, large linear systems, Parallel computing, option pricing, Black Scholes formula

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