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*An iterative semi-analytic procedure for pricing American options.* Preliminary report.

A Green's function-based approach is developed for pricing American options. As a crucial part of the approach, a special technique is proposed for the construction of Green's functions to the Black-Scholes equation. The technique allows to not only obtain the classical special solution to this equation, which is traditionally referred to, in financial engineering, as the Green's function of the Black-Scholes equation, but also permits an application to a variety of problems that vary by boundary conditions imposed. The technique represents an extension of an approach that was earlier developed to partial differential equations in applied mechanics. It is based on the method of integral Laplace transform and the method of variation of parameters, and provides closed form analytic representations for Green's functions. American option problems are simulated by the Black-Scholes equation with a non-linear penalty term, which is tackled on the basis of successive approximations. (Received July 25, 2007)