

Monotone Penalty Method for American Option Pricing

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Abstract:

This paper is devoted to study monotone penalty methods for the pricing of American options. Under the framework of linear complementary and variational inequalities theories, the monotone penalty methods are first proposed, which produce a nonlinear parabolic PDE. Then the convergences of such monotone penalty methods are studied in the infinity dimensional space. In addition, the convergence rates of several frequently used, powerful kinds of monotone method are studied. Numerical scheme is designed to solve the penalty problems. By numerical experiments, some convergence property are revealed, and the efficiency and quality of the monotone penalty methods also are illustrated.