ON MULTIGRID FOR LINEAR COMPLEMENTARITY PROBLEMS WITH APPLICATION TO AMERICAN-STYLE OPTIONS[*]

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Abstract. We discuss a nonlinear multigrid method for a linear complementarity problem. The convergence is improved by a recombination of iterants. The problem under consideration deals with option pricing from mathematical finance. Linear complementarity problems arise from so-called American-style options. A 2D convection-diffusion type operator is discretized with the help of second order upwind discretizations. The properties of smoothers are analyzed with Fourier two-grid analysis. Numerical solutions obtained for the option pricing problem are compared with reference results.

Key words. linear complementarity problems, American-style options, nonlinear multigrid, projected Gauss-Seidel, iterant recombination, second-order upwind discretization, Fourier analysis

AMS subject classifications. 65M55, 65F99, 90A09