1035-35-1686 **Xin Lu*** (lux@uncw.edu), Mathematics and Statistics Department, University of North Carolina Wilmington, Wilmington, NC 28403. *Black Monotone Iterative Method for Parabolic Equations with Nonlinear Boundary Conditions.* Preliminary report.

This talk is concerned with monotone-block iterative methods for numerical solutions of a class of nonlinear parabolic problems with nonlinear boundary conditions in a two-dimensional domain.

The nonlinear parabolic problem is discretized by the finite difference method, then it is solved by using combination of monotone iterative and block iterative methods. Two iterative processes, called block Jacobi and block Gauss-Seidel monotone iterations, are presented for the computation of solutions of the finite difference system using either an upper solution or a lower solution as the initial iteration.

It is shown that the sequence constructed by the block Jacobi or block Gauss-Seidel monotone iterations converges monotonically to a maximal solution or a minimal solution. It is also shown that the finite difference solution converges to the continuous solution as the mesh size tends to zero. Numerical examples are given, and are compared with the known analytical solutions.

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