

# ON SOME PROBLEMS FOR DOUBLY NONLINEAR PARABOLIC EQUATIONS AND EQUATIONS OF VARIABLE TYPE

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In the article, existence theorems are proven of regular solutions to the first and second boundary value problems for a wide class of parabolic equations with double nonlinearity which may degenerate on a solution and on the gradient of a solution. Solvability of variational inequalities connected with these equations is studied. The existence of  $t$ -periodic solutions to nonlinear parabolic equations with changing time direction is established.

*Key words and phrases:* doubly nonlinear parabolic equation, boundary value problem, regular solution, variational inequality, nonlinear parabolic equation with changing time direction,  $t$ -periodic solution.

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Received

June 10, 1999

Translated into English:

*Siberian Advances in Mathematics*, V. 11, N 1, 45–83 (2001).