

Homographic Approximation for Some Nonlinear Parabolic Unilateral Problems

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Abstract: We deal with nonlinear parabolic unilateral problems by means of the homographic approximation, introduced by C. M. Brauner and B. Nicolaenko [in: "Nonlinear Partial Diff. Equations and Their Applications", H. Brezis, J. L. Lions (eds.), Research Notes in Mathematics 70 (1982) 86-128] in the linear elliptic case. The interest in this kind of penalty method arises from the fact that, in contrast with the usual penalization the homographic approximation is a "bounded penalty", which turns out to be convenient to have *a priori* estimates on the approximate solutions.
 We present two different situations in which the homographic approximation gives advantages to solve evolutionary unilateral problems. First, in a variational framework, we are interested in strong solutions to nonlinear parabolic variational inequalities; then, in a second case, we consider obstacle problems with L^1 data.

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