

MONOTONE METHOD FOR PARABOLIC DIFFERENTIAL EQUATIONS AND APPLICATIONS

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Abstract

The method of upper and lower solutions is an interesting and fruitful technique for proving existence and uniqueness results for nonlinear problems. The method of upper and lower solutions and its associated monotone iterations are studied for parabolic differential equations. We study the applications for parabolic initial boundary value problems. The basic idea of this monotone method is that, a suitable iterative process, an upper solution or lower solution is used as initial iteration and shown that the sequence of iteration so obtained is both monotone and convergent, and converges to a solution of the given problem. The content of the paper is as follows: In section 2 we prove positivity lemma. The notion of upper and lower solution is defined. Section 3, is devoted for monotone scheme. Applications are discussed in the last section.

Key Words: Positivity lemma, Upper and lower solution, Monotone property.