Section 09: Partial Differential Equations	Poster number 340

Nonlocal Problems in Time for One Nonlinear Equation of Biomathematics

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ABSTRACT

In the present work we examine nonlocal in time problems with classical boundary conditions for one nonlinear nonstationary equation, originated from the mathematical modeling of certain biochemical process [1].

In the above mentioned problem the linear member is a coercive operator and nonlinear one is monotone operator (e.g. $\frac{u}{1+u}$). Nonlocal in time conditions are given in different forms (e.g. in integral form).

There are investigated the existence and uniqueness of solution for stated problems. To solve these problems some iteration processes are constructed. Some a priori estimations are obtained and convergence of the iteration process is proved.

In certain assumptions positiveness of solution is demonstrated.

Theoretical researches are improved by numerical experiments.

Reference

[1]. Shapatava A. Nonlocal problems in time for one equation of biomathematics. Reports of enlarged sessions of I. Vekua Institute of Applied Mathematics of Tbilisi State University, vol. 14, No. 3, 1999.

Keywords: *nonlocal problems in time, partial differential equations, numerical analysis*

Mathematics Subject Classification: *65, 35*

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