Journal of Mathematical Inequalities
Volume 3, Number 4 (2009), 519–527

ON A FUNCTIONAL VOLTERRA–FREDHOLM INTEGRAL EQUATION, VIA PICARD OPERATORS

NICOLAIE LUNGU AND IOAN A. RUS

Abstract. In this paper we present some results relative to existence, uniqueness, integral inequalities and data dependence for the solutions of the functional Volterra-Fredholm integral equation with deviating argument in a Banach space:

$$u(x,y) = g(x,y,h(u)(x,y)) + \int_0^x \int_0^y K(x,y,s,t,u(s,t))dsdt, \quad x,y \in \mathbb{R}_+$$

by Picard operators technique. This equation is a generalization of the equation (VF) from the paper: B.G. Pachpatte, On Volterra-Fredholm integral equation in two variables, Demonstratio Math., 40(2007), No. 4, 832-852.

Mathematics subject classification (2000): 45G10, 47H10, 45N05, 47N20.
Keywords and phrases: Volterra-Fredholm functional integral equations, contraction principle, Picard operator, existence and uniqueness, data dependence.

REFERENCES

[1] S. S. DRAGOMIR AND N. M. IONESCU, *The Wendorff type lemma and applications (I)*, Itin. Seminar on functional equations, approx. and convexity, Cluj-Napoca, 1987, 135–142.
[2] S. S. DRAGOMIR AND N. M. IONESCU,, *On a nonlinear integral inequalities in two independent variables*, Studia Univ. Babeş-Bolyai, Mathematica, **34** (1989), 11–17.
[3] M. W. HIRSCH AND C. C. PUGH, *Stable manifolds and hyperbolic sets*, Proc. Symp. in Pure Math., AMS, **14** (1970), 133–143.
[4] V. MUREŞAN, *Functional-Integral Equations*, Mediamira, Cluj-Napoca, 2003.
[5] B. G. PACHPATTE, *On Volterra-Fredholm integral equation in two variables*, Demonstratio Mathematica, **40**, 4 (2007), 839–852.
[6] I. A. RUS, *Picard operators and applications*, SFPT, Babeş-Bolyai Univ., Cluj-Napoca, 1996.
[7] I. A. RUS, *Generalized Contractions and Applications*, Cluj University Press, Cluj-Napoca, 2001.
[8] I. A. RUS, *Picard operators and applications*, Scientia Mathematicae Japonicae, **58**, 1 (2003), 191–219.

Paper JMI-03-51