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

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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.

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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.