Fixed Point Theory, Volume 7, No. 2, 2006, 305-313 http://www.math.ubbcluj.ro/~nodeacj/sfptcj.html

ARONSZAJN TYPE THEOREMS FOR INTEGRAL EQUATIONS ON UNBOUNDED DOMAINS VIA MAXIMAL SOLUTIONS

DONAL O'REGAN* AND RADU PRECUP**

Dedicated to Professor Ioan A. Rus on the occasion of his 70th birthday

Department of Mathematics National University of Ireland Galway, Ireland E-mail: donal.oregan@nuigalway.ie

Department of Applied Mathematics Babeş-Bolyai University Cluj-Napoca 400084, Romania E-mail: r.precup@math.ubbcluj.ro

Abstract. This paper discusses the topological structure of the solution set of a general Volterra integral equation. Under natural conditions we show that the solution set is an R_{δ} set.

Key Words and Phrases: Volterra integral equation, solution set, R_{δ} set. 2000 Mathematics Subject Classification: 45G15

References

- R.P. Agarwal, L. Gorniewicz, D. O'Regan, Aronszajn type results for Volterra equations and inclusions, Topological Methods in Nonlinear Analysis, 23(2004), 149-159.
- [2] R.P. Agarwal, M. Meehan, D. O'Regan, Nonlinear integral equations and inclusions, Nova Science Publishers, Huntington, New York, 2001.
- [3] R.P. Agarwal, D. O'Regan, On the topological structure of fixed point sets for abstract Volterra operators on Fréchet spaces, Jour. Nonlinear and Convex Analysis, 3(2000), 271-286.
- [4] D.M. Bedivan, D. O'Regan, Fixed point sets for abstract Volterra operators on Fréchet spaces, Applicable Analysis, 76(2000), 131-152.

1

DONAL O'REGAN AND RADU PRECUP

- [5] C. Corduneanu, Integral Equations and Applications, Cambridge University Press, Cambridge, 1991.
- [6] Z. Kubáček, On the structure of fixed point sets of some compact maps in the Fréchet space, Mathematica Bohemica, 118(1993), 343-358.
- [7] V. Lakshmikantham, S. Leela, *Differential and Integral Inequalities*, Vol. I, Academic Press, New York, 1969.
- [8] D. O'Regan, Topological structure of solution sets in Fréchet spaces: the projective limit approach, Jour. Math. Anal. Appl., to appear.

Received: February 2, 2006; Accepted: February 23, 2006.

 $\mathbf{2}$