

## Fixed point theorems for triangular operators

MARCEL-ADRIAN ȘERBAN

### ABSTRACT.

In this paper we study the existence of the fixed points for triangular operators  $A : X \times Y \rightarrow X \times Y$ ,  $A = (B, C)$ , where  $B : X \rightarrow X$  and  $C : X \times Y \rightarrow Y$ . Also, the well-posedness of the fixed point problem and the limit shadowing property are studied for this type of operators.

### REFERENCES

- [1] Andrász, S., *Fibre  $\varphi$ -contraction on generalized metric spaces and applications*, *Mathematica*, **45**(68) (2003), No. 1, 3–8
- [2] Bacoțiu, C., *Fibre Picard operators on generalized metric spaces*, *Sem. on Fixed Point Theory Cluj-Napoca*, **1** (2000), 5–8
- [3] Berinde, V., *Error estimates in the  $\varphi$ -contractions*, *Studia Univ. Babeș-Bolyai, Math.*, **35** (1990), No. 2, 86–89
- [4] Blumenthal, L. M., *Theory and applications of distance geometry*, Oxford University Press, 1953
- [5] Fréchet, M., *Les espaces abstraits*, Gauthier-Villars, Paris, 1928
- [6] Glăvan, V., Guțu, V., *Shadowing in parametrized IFS*, *Fixed Point Theory*, **7** (2006), No. 2, 263–274
- [7] Pilyugin, S. Yu., *Shadowing in Dynamical Systems*, Springer, Berlin, 1999
- [8] Rus, I. A., *A fibre generalized contraction theorem and applications*, *Mathematica*, **41** (1999), No. 1, 85–90
- [9] Rus, I. A., *Fibre Picard operators and applications*, *Studia Univ. Babeș-Bolyai Math.*, **44** (1999), 89–98
- [10] Rus, I. A., *Fibre Picard operators on generalized metric spaces and applications*, *Scripta Sc. Math.*, **1** (1999), 326–334
- [11] Rus, I. A., *Generalized Contractions and Applications*, Cluj University Press, Cluj-Napoca, 2001
- [12] Rus, I. A., *Metric space with fixed point property with respect to contractions*, *Studia Univ. Babeș-Bolyai Math.*, **51** (2006), No. 3, 115–121
- [13] Rus, I. A., *Picard operators and applications*, *Sci. Math. Japon.*, **58** (2003), 191–219
- [14] Rus, I. A., *Picard operators and well-posedness of fixed point problems*, *Studia Univ. Babeș-Bolyai Math.*, **52** (2007), No. 3, 147–150
- [15] Rus, I. A., *Weakly Picard operators and applications*, *Seminar on Fixed Point Theory, Cluj-Napoca*, **2** (2001), 41–58
- [16] Rus, I. A., Șerban, M. A., *Some generalizations of a Cauchy Lemma and Applications*, *Topics in Mathematics, Computer Science and Philosophy*, Editor Șt. Cobzaș, Presa Univ. Clujeană, 2008, 173–181
- [17] Șerban, M. A., *Fibre contraction theorem in generalized metric spaces*, *Automation Computers Applied Mathematics*, **16** (2007) No. 1-2, 9–14
- [18] Șerban, M. A., *Fibre  $\varphi$ -contractions*, *Studia Univ. Babeș-Bolyai, Math.*, **44** (1999), No. 3, 99–108
- [19] Șerban, M. A., *The fixed point theory for the operators on cartesian product*, (Romanian), Cluj University Press, Cluj-Napoca, 2002

BABEȘ-BOLYAI UNIVERSITY  
DEPARTMENT OF APPLIED MATHEMATICS  
KOGĂLNICEANU 1, 400084 CLUJ-NAPOCA, ROMANIA  
E-mail address: mserban@math.ubbcluj.ro

Received: 30.10.2008 ; In revised form: 20.03.2009; Accepted: 23.03.2009

2000 *Mathematics Subject Classification*. 47H10.

Key words and phrases. *Cauchy lemmas, fixed point, comparison functions, fibre  $\varphi$ -contraction theorem, well-posedness of the fixed point problem, limit shadowing property.*