

## Properties of the solutions of those equations for which the Krasnoselskii iteration converges

IOAN A. RUS

### ABSTRACT.

Let  $(X, +, \mathbb{R}, \rightarrow)$  be a vectorial  $L$ -space,  $Y \subset X$  a nonempty convex subset of  $X$  and  $f : Y \rightarrow Y$  be an operator with  $F_f := \{x \in Y \mid f(x) = x\} \neq \emptyset$ . Let  $0 < \lambda < 1$  and let  $f_\lambda$  be the Krasnoselskii operator corresponding to  $f$ , i.e.,

$$f_\lambda(x) := (1 - \lambda)x + \lambda f(x), \quad x \in Y.$$

We suppose that  $f_\lambda$  is a weakly Picard operator (see I. A. Rus, *Picard operators and applications*, Sc. Math. Japonicae, **58** (2003), No. 1, 191-219). The aim of this paper is to study some properties of the fixed points of the operator  $f$ : Gronwall lemmas and comparison lemmas (when  $(X, +, \mathbb{R}, \rightarrow, \leq)$  is an ordered  $L$ -space) and data dependence (when  $X$  is a Banach space). Some applications are also given.

DEPARTMENT OF MATHEMATICS  
BABEȘ-BOLYAI UNIVERSITY  
KOGĂLNICEANU 1, 400084, CLUJ-NAPOCA, ROMANIA  
E-mail address: [iarus@math.ubbcluj.ro](mailto:iarus@math.ubbcluj.ro)