Fixe dPoint Theory, 19(2018), No. 1, 275-286
DOI 10.24193/fpt-ro.2018.1.22
http://www.math.ubbcluj.ro/~nodeacj/sfptcj.html

THE MONOTONE MINORANT METHOD AND EIGENVALUE PROBLEM FOR MULTIVALUED OPERATORS IN CONES

NGUYEN BICH HUY*, TRAN THANH BINH** AND VO VIET TRI***

*Applied Analysis Research Group, Faculty of Mathematics and Statistics
Ton Duc Thang University, Ho Chi Minh City, Vietnam
E-mail: nguyenbichhuy@tdt.edu.vn

**Department of Mathematics and Applications, Sai Gon University
273 An Duong Vuong, Ho Chi Minh City, Vietnam
E-mail: tranthanhbinhsgu@gmail.com

***Department of Natural Science, Thu Dau Mot University
6 Tran Van On, Binh Duong province, Vietnam
E-mail: trivv@tdmu.edu.vn

Abstract. The main aim of this paper is to obtain a general theorem on existence of continuous branch of solutions of equations which depend on a parameter by using the monotone minorant method in conjunction with the theory of fixed point index. As an application, we apply this theorem to prove the existence of a positive eigen-pair of multivalued homogeneous increasing operators. The simplicity and uniqueness of the eigen-pair are also investigated in this paper.

Key Words and Phrases: Cone, positive eigen-pair, fixed point index, monotone minorant, multivalued increasing operator.

2010 Mathematics Subject Classification: 47H04, 47H07, 47H10, 35P30.

Acknowledgements. The authors are very grateful to the referee for his/her careful reading of the work that improve the paper. This paper is funded by Vietnam National Foundation for Science and Technology Development (NAFOSTED) under grant number 101.02-2015.33. The paper was completed when the first author was visiting to Vietnam Institute for Advanced Study in Mathematics (VIASM). He would like to thank the Institute for its hospitality.

References


[20] W.V. Petryshyn, On the solvability of \( x \in Tx + \lambda Fx \) in quasinormal cone with \( T \) and \( F \) \( k \)-contractive, Nonlinear Anal., 5 (1981), 585-591.

Received: December 17, 2015; Accepted: April 8, 2016.