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FIXED POINT THEORY FOR SUZUKI TYPE (θ, L)-WEAK MULTIVALUED OPERATORS

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Abstract. Existence of a fixed point of Suzuki type (θ, L)- weak multivalued operator is obtained. As an application, we obtain homotopy and data dependence results for Suzuki type contractive multivalued operator. Our results complement and extend some very recent comparable results in the existing literature.
Key Words and Phrases: metric space, fixed point, data dependence, weak multivalued operator.
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References

[1] J.P. Aubin, J. Siegel, *Fixed points and stationary points of dissipative multivalued maps*, Proc. Amer. Math. Soc., **78**(1980), 391-398.
[2] M. Berinde, V. Berinde, *On a general class of multivalued weakly Picard mappings*, J. Math. Anal. Appl., **326**(2007), 772-782.
[3] Lj. B. Ciric, *A generalization of Banach's contraction principle*, Proc. Am. Math. Soc., **45**(1974), 267-273.
[4] M. Frigon, A. Granas, *Résultats du type de Leray-Schauder pour les contractions multivoques*, Topol. Methods Nonlinear Anal., **4**(1994), 197-208.
[5] N. Hussain, D. Dorić, Z. Kadelburg, S. Radenović, *Suzuki-type fixed point results in metric type spaces*, Fixed Point Theory Appl., **2012**(126)(2012), doi:10.1186/1687-1812-2012-126.
[6] D. Klim, D. Wardowski, *Fixed Point Theorems for Set-Valued Contractions in Complete Metric Spaces*, J. Math. Anal. Appl., **334**(2007), 132-139.
[7] M. Kikkawa, T. Suzuki, *Some similarity between contractions and Kannan mappings*, Fixed Point Theory Appl., **2008**(2008), Art. ID 649749, 8 pp.
[8] M. Kikkawa, T. Suzuki, *Three fixed point theorems for generalized contractions with constants in complete metric spaces*, Nonlinear Anal., **69**(2008), 2942-2949.
[9] J.T. Markin, *Continuous dependence of fixed point sets*, Proc. Amer. Math. Soc., **38**(1973), 545-547.
[10] M. Maschler, B. Peleg, *Stable sets and stable points of set-valued dynamic systems with applications to game theory*, SIAM J. Control Optim., **14**(1976), 985-995.

[11] G. Moţ, A. Petruşel, *Fixed point theory for a new type of contractive multivalued operrators*, Nonlinear Anal., **70**(2009), 3371-3377.
[12] S.B. Nadler, *Multivalued contraction mappings*, Pacific J. Math., **30**(1969), 475-488.
[13] T. Suzuki, *A generalized Banach contraction principle that characterizes metric completeness*, Proc. Amer. Math. Soc., **136**(2008), 1861-1869.
[14] K. Włodarczyk, D. Klim, R. Plebaniak, *Existence and uniqueness of endpoints of closed set-valued asymptotic contractions in metric spaces*, J. Math. Anal. Appl., **328**(2007), no. 1, 46-57.
[15] R. Bellman, E.S. Lee, *Functional equations arising in dynamic programming*, Aequationes Math., **170**(1978), 1-18.
[16] Z. Liu, R.P. Agarwal, S.M. Kang, *On solvability of functional equations and system of functional equations arising in dynamic programming*, J. Math. Anal. Appl., **297**, 111–130.
[17] Z. Liu, L. Wang, H.K. Kim, S.M. Kang, *Common fixed point theorems for contractive type mappings and their applications in dynamic programming*, Bull. Korean Math. Soc., **45**(2008), no. 3, 573–585.
[18] I.A. Rus, A. Petruşel, A. Sîntămărian, *Data dependence of the fixed point set of some multivalued weakly Picard operators*, Nonlinear Anal., **52**(2003), 1947-1959.

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