

GENERALIZED NONEXPANSIVE MULTIVALUED MAPPINGS IN STRICTLY CONVEX BANACH SPACES

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Abstract. In this paper, we present some common fixed point results for a commuting pair of mappings, including a quasi-nonexpansive single valued mapping and a generalized nonexpansive multivalued mapping in strictly convex Banach spaces, as well as for a pointwise asymptotically nonexpansive mapping and a generalized nonexpansive multivalued mapping in uniformly convex Banach spaces. The results we obtain extend and improve some known results due to Garcia-Falset et al. (2011), Kirk and Massa (1990), Espinola et al. (2011), Kaewcharoen and Panyanak (2011) as well as that of Abkar and Eslamian (2010).

Key Words and Phrases: Common fixed point, pointwise asymptotically nonexpansive mapping, quasi-nonexpansive mapping, generalized nonexpansive multivalued mapping, strictly convex Banach space.

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REFERENCES

- [1] A. Abkar, M. Eslamian, *Fixed point theorems for Suzuki generalized nonexpansive multivalued mappings in Banach spaces*, Fixed Point Theory and Applications, 2010, Article ID 457935, 10 pp (2010).
- [2] A. Abkar, M. Eslamian, *Common fixed point results in $CAT(0)$ spaces*, Nonlinear Anal., **74**(2011), 1835-1840.
- [3] A. Abkar, M. Eslamian, *A fixed point theorem for generalized nonexpansive multivalued mappings*, Fixed Point Theory, **12**(2011), 241-246.
- [4] S. Dhompongsa, A. Kaewcharoen, A. Kaewkhao, *The Dominguez-Lorenzo condition and multivalued nonexpansive mappings*, Nonlinear Anal., **64**(2006), 958-970.
- [5] R. Espinola, P. Lorenzo, A. Nicolae, *Fixed points, selections and common fixed points for nonexpansive-type mappings*, J. Math. Anal. Appl., **382**(2011), 503-515.
- [6] J. Garcia-Falset, E. Llorens-Fuster, T. Suzuki, *Fixed point theory for a class of generalized nonexpansive mappings*, J. Math. Anal. Appl., **375**(2011), 185-195.
- [7] K. Goebel, *On a fixed point theorem for multivalued nonexpansive mappings*, Ann. Univ. Marie Curie-Sklodowska, **29**(1975), 70-72.

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- [8] K. Goebel, W.A. Kirk, *Iteration processes for nonexpansive mappings*, Contemp. Math., **21**(1983), 115-123.
- [9] K. Goebel, W.A. Kirk, *Topics in Metric Fixed Point Theory*, Cambridge Univ. Press, 1990.
- [10] S. Hu, N. Papageorgiou, *Handbook of Multivalued Analysis*, vol. 1, Kluwer Acad. Publ, Dordrecht, 1997.
- [11] S. Itoh, W. Takahashi, *The common fixed point theory of single valued mappings and multivalued mappings*, Pacific J. Math., **79**(1978), 493-50.
- [12] A. Kaewcharoen, B. Panyanak, *Fixed point theorems for some generalized multivalued nonexpansive mappings*, Nonlinear Anal., **74**(2011), 5578-5584.
- [13] M.A. Khamsi, W.A. Kirk, *An Introduction to Metric Spaces and Fixed Point Theory*, John Wiley, New York, 2001.
- [14] W.A. Kirk, H.K. Xu, *Asymptotic pointwise contractions*, Nonlinear Anal., **69**(2008), 4706-4712.
- [15] W.A. Kirk, S. Massa, *Remarks on asymptotic and Chebyshev centers*, Houston J. Math., **16**(1990), 357-364.
- [16] T.C. Lim, *A fixed point theorem for multivalued nonexpansive mappings in a uniformly convex Banach space*, Bull. Amer. Math. Soc., **80**(1974), 1123-1126.
- [17] J. Markin, *A fixed point theorem for set valued mappings*, Bull. Amer. Math. Soc., **74**(1968), 639-640.
- [18] S.B. Nadler, *Multi-valued contraction mappings*, Pacific J. Math., **30**(1969), 475-488.
- [19] T. Suzuki, *Fixed point theorems and convergence theorems for some generalized nonexpansive mappings*, J. Math. Anal. Appl., **340**(2008), 1088-1095.

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