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CONVERGENCE THEOREMS FOR k–DIMEICONTACTIVE MAPPINGS IN HILBERT SPACES

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Abstract. In this paper, we prove weak and strong convergence theorems for Moudafi's iterative scheme of two k-demicontractive mappings in Hilbert spaces. Our results improve and extend the recent results of Kim and some others.

Mathematics subject classification (2010): 49J40, 47J20.
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REFERENCES

[1] R. P. AGARWAL, D. O'REGAN, D. R. SAHU, *Fixed Points Theory for Lipschitzain-type Mappings with Applications*, Springer-Verlag (2008).
[2] F. E. BROWDER, *Convergence theorems for sequences of nonlinear operators in Banach spaces*, Math. Z., **100** (1967), 201–225.
[3] F. E. BROWDER, *Semicontractive and semiaccretive nonlinear mappings in Banach spaces*, Bull. Amer. Math. Soc., **74** (1968), 660–665.
[4] K. GOEBEL, W. A. KIRK , *Topics in Metric Fixed Point Theory*, Cambridge University Press, Cambridge (1990).
[5] K. GOEBEL, S. REICH, *Uniform Convexity, Hyperbolic Geometry, and Nonexpansive Mappings*, Marcel Dekker Inc., New York (1984).
[6] T. L. HICKS, J. D. KUBICEK, *On the Mann iteration process in a Hilbert spaces*, J. Math. Anal. Appl., **59**(1977), 498–504.
[7] S. IEMOTO, W. TAKAHASHI, *Approximating common fixed points of nonexpansive mappings and nonspreading mappings in a Hilbert spaces*, Nonlinear Anal., **71** (2009), 2082–2089.
[8] S. H. KHAN, H. F. FUKHAR-UD-DIN, *Weak and strong convergence of a scheme with errors for two nonexpansive mappings*, Nonlinear Anal., **71** (2005), 1295–1301.
[9] G. E. KIM, *Weak and strong convergence theorems of quasi-nonexpansive mappings in a Hilbert spaces*, J. Optim. Theory Appl., **152** (2012), 727–738.
[10] F. KOHSAKA, W. TAKAHASHI, *Fixed point theorems for a class of nonlinear mappings related to maximal monotone operators in Banach spaces*, Arch. Math. (Basel), **91** (2008), 166–177.
[11] F. KOHSAKA, W. TAKAHASHI, *Existence and approximation of fixed points of firmly nonexpansive-type mappings in Banach spaces*, SIAM J. Optim., **19** (2008), 824–835.
[12] F. KOHSAKA, W. TAKAHASHI, *Fixed point theorems for a class of nonlinear mappings relate to maximal monotone operators in Banach spaces*, Arch. Math. (Basel), **91** (2008), 166–177.
[13] S. MATSUSHITA, W. TAKAHASHI, *Weak and strong convergence theorems for relatively nonexpansive mappings in Banach spaces*, Fixed Point Theory Appl., **2004** (2004), 37–47.
[14] A. MOUDAFI, *Krasnoselski-Mann iteration for hierarchical fixed-point problems*, Inverse Problems, **23** (2007), 1635–1640.
[15] Z. OPIAL, *Weak convergence of the sequence of successive approximations for nonexpansive mapping*, Bull. Amer. Math. Soc., **73** (1967), 591–597.
[16] M. O. OSILIKE, F. O. ISIOGUGU, *Weak and strong convergence theorems for nonspreading-type mappings in Hilbert spaces*, Nonlinear Anal., **74** (2011), 1814–1822.

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[17] S. REICH, D. SHOIKHET, *Nonlinear Semigroups, Fixed Points, and Geometry of Domains in Banach Spaces*, Imperial College Press, London (2005).
[18] H. F. SENTER, W. G. DOTSON, JR., *Approximating fixedpoints of nonexpansivemappings*, Proc. Amer. Math. Sac., **44** (1974), 375–380.
[19] W. TAKAHASHI, *Introduction to Nonlinear and Convex Analysis*, Yokohama Publishers, Yokohama (2005) (in Japanese)
[20] W. TAKAHASHI, T. TAMURA, *Convergence theorems for a pair of nonexpansive mappings*, J. Convex Anal., **5** (1998), 45–56.
[21] W. TAKAHASHI, *Introduction to Nonlinear and Convex Analysis, Yokohoma Publishers*, Yokohoma, 2009.
[22] K. K. TAN, H. K. XU, *Approximating fixed points of nonexpansive mappings by the Ishikawa iteration process*, J. Math. Anal. Appl., **178** (1993), 301–308.