

BEST PROXIMITY POINT THEOREMS FOR NON-SELF MAPPINGS

V. SANKAR RAJ

Department of Mathematics
Manonmaniam Sundaranar University
Tirunelveli 627 012, Tamil Nadu, India
E-mail: sankarraju@gmail.com

Abstract. Let us consider a pair (A, B) of nonempty subsets of a metric space X and a mapping $T : A \rightarrow B$. In this article, we introduced a notion called P -property and used it to prove sufficient conditions for the existence of a point $x_0 \in A$, called best proximity point, satisfying $d(x_0, Tx_0) = \text{dist}(A, B) := \inf\{d(a, b) : a \in A, b \in B\}$.

Key Words and Phrases: Best proximity point, contraction map, P -property, metric projection.
2010 Mathematics Subject Classification: 41A65, 46B20, 47H10.

REFERENCES

- [1] W.A. Kirk, *Contraction mappings and extensions*, Handbook of Metric Fixed Point Theory, (W.A. Kirk, B. Sims - Eds.), Kluwer Academic Publ., Dordrecht, 2001, 1–34.
- [2] B.E. Rhoades, *A comparison of various definitions of contractive mappings*, Trans. Amer. Math. Soc., **226**(1977), 257–290.
- [3] W.A. Kirk, P.S. Srinivasan, P. Veeramani, *Fixed points for mappings satisfying cyclic contractive conditions*, Fixed Point Theory, **4**(2003), no. 1, 79–89.
- [4] A.A. Eldred, P. Veeramani, *Existence and convergence of best proximity points*, J. Math. Anal. Appl., **323**(2006), no. 2, 1001–1006.
- [5] M.A. Al-Thagafi, N. Shahzad, *Convergence and existence results for best proximity points*, Nonlinear Anal., **70**(2009), 3665–3671.
- [6] T. Suzuki, M. Kikkawa, C. Vetro, *The existence of best proximity points in metric spaces with the property UC*, Nonlinear Anal., **71**(2009), no. 7-8, 2918–2926.
- [7] C. Vetro, *Best proximity points: convergence and existence theorems for p -cyclic mappings*, Nonlinear Anal., **73**(2010), no. 7, 2283–2291.
- [8] A. Abkar, M. Gabeleh, *Results on the existence and convergence of best proximity points*, Fixed Point Theory Appl. 2010, Art. ID 386037, 10 pp.
- [9] G. Sankara Raju Kosuru, P. Veeramani, *A note on existence and convergence of best proximity points for pointwise cyclic contractions*, Numer. Funct. Anal. Optim., **32**(2011), no. 7, 821-830.
- [10] S. Sadiq Basha, *Extensions of Banach's contraction principle*, Numer. Funct. Anal. Optim., **31**(2010), no. 5, 569-576.
- [11] W.A. Kirk, S. Reich, P. Veeramani, *Proximinal retracts and best proximity pair theorems*, Numer. Funct. Anal. Optim., **24**(2003), no. 7-8, 851-862.
- [12] S. Sadiq Basha, P. Veeramani, *Best proximity pair theorems for multifunctions with open fibres*, J. Approx. Theory, **103**(2000), no. 1, 119–129.

- [13] A. Anthony Eldred, V. Sankar Raj, *On common best proximity pair theorems*, Acta Sci. Math. Szeged, **75**(2009), 707–721.

Received: June 17, 2011; Accepted: November 18, 2011.

