Fixed Point Theory, 22(2021), No. 2, 881-886
DOI: 10.24193/fpt-ro.2021.2.57
http://www.math.ubbcluj.ro/~nodeacj/sfptcj.html

GEOMETRICAL PROPERTIES OF l_p SPACES

SAMI SHUKRI

Department of Mathematics
Al-Hussein Bin Talal University
Ma'an 71111, Jordan
E-mail: sami.a.shukri@ahu.edu.jo

Abstract. In this work, some geometrical properties of Hilbert spaces are investigated in l_p spaces, for $p \geq 2$. As an application, we obtain an extension of the Banach Contraction Principle for best proximity points. The case of nonexpansive mappings is also discussed.
Key Words and Phrases: Best proximity points, fixed points, l_p spaces, P-property, contraction mappings, nonexpansive mappings, uniformly convex, strictly convex reflexive, proximinal sets.
2020 Mathematics Subject Classification: 47H10, 54H25, 47H09, 46B45.

Acknowledgment. The author gratefully thanks the reviewer for extremely useful comments on the previous version of the manuscript.

References

[1] A. Abkar, M. Gabeleh, *Global optimal solutions of noncyclic mappings in metric spaces*, J. Optim Theory Appl., **153**(2012), 298-305.
[2] F.B. Browder, *Nonexpansive nonlinear operators in a Banach space*, Proc. Nat. Acad. Sci. U.S.A., **54**(1965), 1041-1044.
[3] J.A. Clarkson, *Uniformly convex spaces*, Trans. Amer. Math. Soc., **40**(1936), 396-414.
[4] A. Eldred, W.A. Kirk, P. Veeramani, *Proximal normal structure and relatively nonexpansive mappings*, Stud. Math., **3**(2005), 283-293.
[5] A. Eldred, P. Veeramani, *Existence and convergence of best proximity points*, J. Math. Anal. Appl., **323**(2006), 1001-1006.
[6] R. Espinola, A. Fernández-León, *On best proximity points in metric and Banach spaces*, Canad. J. Math., **63**(2011), 533–550.
[7] G. Göhde, *Zumprinzip der kontraktiven Abbildung*, Math. Nachr., **30**(1965), 251-258.
[8] M.A. Khamsi, S. Shukri, *Generalized $CAT(0)$ spaces,* Bull. Belg. Math. Soc. Simon Stevin, **24**(2017), 417-426.
[9] A.R. Khan, S. Shukri, *Best proximity points in the Hilbert ball* , Journal of Nonlinear and Convex Analysis, **17**(2016), 1083-1094.
[10] W.A. Kirk, S. Reich, P. Veeramani, *Proximinal retracts and best proximity pair theorems*, Numer. Func. Anal. Optim., **24**(2003), 851-862.
[11] V.S. Raj, *A best proximity point theorem for weakly contractive non-self-mappings*, Nonlinear Anal., **74**(2011), 4804-4808.
[12] V.S. Raj, A.A. Eldred, *A characterization of strictly convex spaces and applications,* J. Optim. Theory Appl., **160**(2014), 703-710.

[13] S. Shukri, A.R. Khan, *Best proximity points in partially ordered metric spaces,* Advances in Fixed Point Theory, **8**(2017), 118-130.
[14] V. Smulian, *On the principle of inclusion in the space of the type* (B), Matematicheskii Sbornik, **47**(1939), 317-328.

Received: January 7, 2020; Accepted: May 16, 2020.