

## ON THE SU-YAO THEOREM

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**Abstract.** Su and Yao [Fixed Point Theory Appl. 2015:120 (2015)] have proved a fixed point theorem for mappings in metric spaces satisfying a general contraction condition. In their paper numerous examples of important consequences of this theorem are given. Our main aim is to present an extension of the Su-Yao theorem to the case of dislocated metric spaces. The proof is short, the result is stronger also for metric spaces, and the theorem itself is a natural and elegant extension of the celebrated Banach fixed point theorem.

**Key Words and Phrases:** Dislocated metric, partial metric, fixed point, general contraction.

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### REFERENCES

- [1] H. Aydi, W. Shantawi, M. Postolache, Z. Mustafa, N. Tahat, *Theorems for Boyd-Wong-type contractions in ordered metric spaces*, Abstr. Appl. Anal., **2012**, ID 359054.
- [2] D.W. Boyd, J.S.W. Wong, *On nonlinear contractions*, Proc. Amer. Math. Soc., **20**(1969), 458-464.
- [3] P. Hitzler, A.K. Seda, *Dislocated topologies*, J. Electr. Engin., **51(12)**(2000), 3-7.
- [4] G.F. Jungck, B.E. Rhoades, *General fixed point results in dislocated metric spaces*, Fixed Point Theory, **18(2)**(2017), 615-624.
- [5] W.A. Kirk, P.S. Srinivasan, P. Veeramani, *Fixed points for mappings satisfying cyclical contractive conditions*, Fixed Point Theory **4(1)**(2003), 79-89.
- [6] S.G. Matthews, *Partial metric topology*, Proc. 8th Summer Conference on General Topology and Applications, Ann. New York Acad. Sci., **728**(1994), 183-197.
- [7] S. Oltra, O. Valero, *Banach's fixed point theorem for partial metric spaces*, Rend. Istit. Mat. Univ. Trieste, **36**(2004), 17-26.
- [8] L. Pasicki, *Fixed point theorems for contracting mappings in partial metric spaces*, Fixed Point Theory Appl., **2014:185**(2014).
- [9] L. Pasicki, *Dislocated metric and fixed point theorems*, Fixed Point Theory Appl., **2015:82**(2015).
- [10] L. Pasicki, *The Boyd-Wong idea extended*, Fixed Point Theory Appl., **2016:63**(2016).
- [11] L. Pasicki, *Some extensions of the Meir-Keeler theorem*, Fixed Point Theory Appl., **2017:1**(2017).

- [12] L. Pasicki, *Dislocated quasi-metric and generalized contractions*, Fixed Point Theory, **19**(2018), no. 1, 359-368.
- [13] S. Romaguera, *A Kirk type characterization of completeness for partial metric spaces*, Fixed Point Theory Appl., art. ID 493298 (2010).
- [14] I.A. Rus, *Cyclic representation and fixed points*, Ann. Tiberiu Popoviciu Semin. Funct. Eq. Approx. Convexity, **3**(2005), 171-178.
- [15] W. Shantawi, M. Postolache, *Coincidence and fixed point results for generalized weak contractions in the sense of Berinde on partial metric spaces*, Fixed Point Theory Appl., **2013:54** (2013).
- [16] Y. Su, J.C. Yao, *Further generalized contraction mapping principle and best proximity theorem in metric spaces*, Fixed Point Theory Appl., **2015:120**(2015).
- [17] F.M. Zeyada, G.H. Hassan, M.A. Ahmed, *A generalization of a fixed point theorem due to Hitzler and Seda in dislocated quasi-metric spaces*, Arab. J. Sci. Eng. Sect. A, **31**(2006), no. 1, 111-114.

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