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Strong convergence theorems by hybrid methods for nonexpansive mappings with equilibrium problems in Banach spaces

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Abstract. Our purpose in this paper is to prove strong convergence theorems by hybrid methods for nonexpansive mappings in a Banach space under appropriate conditions. We first prove a strong convergence theorem by the shrinking projection method for semi-positively homogeneous nonexpansive mappings with an equilibrium problem in a Banach space. Next, we obtain another strong convergence theorem by the monotone hybrid method for semi-positively homogeneous nonexpansive mappings with an equilibrium problem in a Banach space. These theorems are proved by using the concept of set convergence.

Key words: Nonexpansive mapping, fixed point, hybrid method, Mosco convergence, equilibrium problem, projection

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