On a generalized proximal point method for solving equilibrium problems in Banach spaces[*]

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Abstract

We introduce a regularized equilibrium problem in Banach spaces, involving generalized Bregman functions. For this regularized problem, we establish the existence and uniqueness of solutions. These regularizations yield a proximal-like method for solving equilibrium problems in Banach spaces. We prove that the proximal sequence is an asymptotically solving sequence when the dual space is uniformly convex. Moreover, we prove that all weak accumulation points are solutions if the equilibrium function is lower semicontinuous in its first variable. We prove, under additional assumptions, that the proximal sequence converges weakly to a solution.

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