Modified Basic Projection Methods for a Class of Equilibrium Problems

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Abstract: Let C be a nonempty closed convex subset of $\mathcal{R}^n$, and f be a bifunction from $C \times C$ to $\mathcal{R}$. We consider the equilibrium problem:

$$\text{Find } x^* \in C \text{ such that } f(x^*, y) \geq 0 \text{ for all } y \in C.$$

Projection methods are a popular class of methods for solving the equilibrium problem. In this talk, we present approximate one-projection methods for solving a class of equilibrium problems, where the cost bifunctions are paramonotone, the feasible sets are defined by a continuous convex function inequality and not necessarily differentiable. At each main iteration step in our algorithms, the usual projections onto the feasible set are replaced by computing inexact subgradients and one projection onto the intersection of two halfspaces containing the solution set of the equilibrium problems. Then, by choosing suitable parameters, we prove convergence of the whole generated sequence to a solution of the problems, under only the assumptions of continuity and paramonotonicity of the bifunctions. Finally, we present some computational examples to illustrate the assumptions of the proposed algorithms.

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