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**JIawei CHEN**, Southwest University, PRC and UBC Okanagan, CA

*Optimality conditions of constrained inverse variational inequalities via image space analysis*

Inverse variational inequalities (IVI) is a special model of variational inequalities, which was extensively applied to transportation, economic management, optimal control and algorithm design and so on. In this talk, we introduce a new constrained IVI. By using oriented distance function and indicator function, two nonlinear (regular) weak separation functions are proposed. Moreover, by the nonlinear separation functions, theorems of the weak alternative and necessary and sufficient optimality conditions for constrained IVI are established. A global saddle-point condition for a nonlinear function is also derived. It is shown that the existence of a saddle point, which implies the existence of solutions of IVI with constraints, is equivalent to a nonlinear regular separation of two suitable subsets of the image space. The relationships between constrained IVI and its primal variational inequalities are also presented under some suitable conditions.