

Toward tractable conditions for lower semi-continuity of set-valued maps: concepts and applications

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Lower semicontinuity is a key continuity concept in set-valued analysis, but it is also known to be somehow difficult to establish when one wants to tackle specific set-valued maps like constraint maps of quasi-variational inequalities or generalized Nash equilibrium problems or quasi-optimization problems. A classical sufficient condition to obtain the lower semicontinuity is the openness of the graph of the map or of its fibers. Our aim in this work is to propose a weaker concept, called densely locally constant, ensuring the lower semicontinuity and, at the same time, with powerful properties like local intersection property or stability over convexification or intersection. Moreover, this new concept allows us to prove alternative selection results, fixed-point theorems and the maximum principle.

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