Ekeland Variational Principle (EkVP) and completeness in quasi-metric spaces

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Abstract

The famous EkVP holds in complete metric spaces and its validity implies the completeness of the underlying metric space. A quasi-metric space is a pair (X, d), where d satisfies all the axioms of a metric but symmetry: it is possible that d(x,y) be different from d(y,x) for some x,y. This, apparently minor, modification of the axioms of a metric drastically changes the properties of these spaces, mainly in what concern completeness and compactness (there are 7 notions of Cauchy sequence yielding 14 notions of completeness and the known characterizations of compactness in metric spaces fail in the quasi-metric case). The aim of this talk is to present some versions of EkVP in quasi-metric spaces in connection with the completeness properties of these spaces.