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Necessary Conditions for Constrained Optimization in Metric Spaces. Preliminary report.

We present an abstract multiplier rule for minimum points of a function J on a metric space W subject to an operator constraint $S(w) \in W$, where $S : W \rightarrow Z$, Z is a Banach space and $Q \subset Z$ is a given subset. The multiplier rule is stated in terms of a generic subdifferential of the distance function of Q and the sequential derivatives of J and S . Specific necessary conditions for minimum points can be derived by applying the abstract multiplier rule to various situations. Two examples will be discussed. In the first example we assume that Z is weakly compactly generated Asplund. In the second example we review the case where Z^* is strictly convex and Q is convex and obtain a slight generalization of an early result proved by McAsey and Mou. (Received January 16, 2007)