

SUBDIFFERENTIATION OF INFINITE SUM FUNCTIONS AND REGULARITY-STATIONARITY PROPERTIES OF INFINITE COLLECTIONS OF SETS

ABDERRAHIM HANTOUTE

ABSTRACT. We provide calculus rules for the (Fréchet) subdifferential of the infinite sum of an arbitrarily indexed lsc functions defined on a given Banach space (possibly Asplund). Due to the generality of this setting (namely, the absence of special structures in the index set), the resulting sum function can not be regarded as an integral function, and so we can not use the abundant and rich literature on subdifferentials of integral functions. Considering (raw) discrete sum instead of the usual continuous sum allows one to overcome the requirement of measurable structures on the index set and some restriction on the underlying space as separability. Also, we do not need to face the difficult issue raised by the use of vector integration in general Banach spaces. We shall start with the the convex case in order to know about the optimal results that one can expect, but, also, because these results are needed in the nonsmooth case, especially to get subdifferential formulas with nice topology properties in the reflexive case—This way we can target a broader group of potential readers. This is a part of a joined work with Alex Kruger.