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A Uniform Approach to Hölder Calmness of Subdifferentials

For finite-valued convex functions f defined on the n -dimensional Euclidean space, we are interested in the set-valued mapping assigning to each pair (f, x) the subdifferential of f at x . Our approach is uniform with respect to f in the sense that it involves pairs of functions close enough to each other, but not necessarily around a nominal function. More precisely, we provide lower and upper estimates, in terms of Hausdorff excesses, of the subdifferential of one of such functions at a nominal point in terms of the subdifferential of nearby functions in a ball centered in such a point. In particular, we obtain the $(1/2)$ -Hölder calmness of our mapping at a nominal pair (f, x) under the assumption that the subdifferential mapping viewed as a set-valued mapping from \mathbb{R}^n to \mathbb{R}^n with f fixed is calm at each point of $\{x\} \times \partial f(x)$.

Keywords: Convex functions, subdifferentials, Hausdorff excess, uniform spaces, Hölder calmness.

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