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A note on intermediate differentiability of Lipschitz functions

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Abstract: Let f be a Lipschitz function on a superreflexive Banach space X . We prove that then the set of points of X at which f has no intermediate derivative is not only a first category set (which was proved by M. Fabian and D. Preiss for much more general spaces X), but it is even σ -porous in a rather strong sense. In fact, we prove the result even for a stronger notion of uniform intermediate derivative which was defined by J.R. Giles and S. Sciffer.

Keywords: Lipschitz function, intermediate derivative, σ -porous set, superreflexive Banach space

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