K–subadditive set–valued functions bounded on "large" sets

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It is well known that every subadditive function $f : \mathbb{R}^n \to \mathbb{R}$ upper bounded on a set $T \subset \mathbb{R}^n$ which is of positive Lebesgue measure or is of the second category with the Baire property has to be locally bounded at every point of $\mathbb{R}^n$. This classical result was generalized by N.H. Bingham et al. in [1] to the case of others "large" sets in abelian Polish groups, e.g. not null–finite, not Haar–meager, not Haar–null sets.

Recall also that a function f is called superadditive, if $-f$ is subadditive.

We extend the notions of subadditive and superadditive functions to K–subadditive and K–superadditive set–valued maps. Next, we prove theorems which are far–reaching generalizations of the results mentioned above. The idea of K–subadditivity and K–superadditivity refers to the paper [2].

This is joint work with Kazimierz Nikodem.

References

[1] N.H. Bingham, E. Jabłońska, W. Jabłoński, A.J. Ostaszewski, *On subadditive functions bounded above on a "large" set*, Results Math. 75 (2020), 58.

[2] K. Nikodem, *K–convex and K–concave set–valued functions*, Zeszyty Nauk. Politechniki Łódzkiej Mat. 559; Rozprawy Mat. 114, Łódź 1989.