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Non-Lebesgue measurability of finite unions of Vitali selectors related to different groups.

Summary: In this paper, we prove that each topological group isomorphism of the additive topological group $(\mathbb{R}, +)$ of real numbers onto itself preserves the non-Lebesgue measurability of Vitali selectors of $\mathbb{R}$. Inspired by Kharazishvili’s results, we further prove that each finite union of Vitali selectors related to different countable dense subgroups of $(\mathbb{R}, +)$, is not measurable in the Lebesgue sense. From here, we produce a semigroup of sets, for which elements are not measurable in the Lebesgue sense. We finally show that the produced semigroup is invariant under the action of the group of all affine transformations of $\mathbb{R}$ onto itself.

MSC:
28B20 Set-valued set functions and measures; integration of set-valued functions; measurable selections
22A05 Structure of general topological groups
28A05 Classes of sets (Borel fields, $\sigma$-rings, etc.), measurable sets, Suslin sets, analytic sets

Full Text: DOI

References:

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