

On the complexity of \mathcal{T} -regular sets

Abstract

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Given an equivalence class $[A]$ in a measure algebra, let $\Phi([A])$ be the set of points of the space having density 1 in A . Sets of the form $\Phi([A])$ are called \mathcal{T} -regular. In [AC13] the authors show many descriptive set theoretic properties about \mathcal{T} -regular sets in the measure algebra of the Cantor space equipped with the Lebesgue measure. In particular, they establish that the generic \mathcal{T} -regular set is Π_3^0 -complete, i.e. the classes $[A]$ such that $\Phi([A])$ is Π_3^0 -complete form a comeager subset of the measure algebra. We generalise this result to any "balanced" measure on the Cantor space. Furthermore, we look at the real line endowed with the Lebesgue measure, showing that the sets of the density points of any "triadic Cantor set" of positive measure results Π_3^0 -complete.

References

- [AC13] Andretta, Alessandro; Camerlo, Riccardo: The descriptive set theory of the Lebesgue Density Theorem. *Advances in Mathematics* 234 (2013) 1-42. ISSN 0001-8708