

Alexey Ostrovsky

Questions

Acta Universitatis Carolinae. Mathematica et Physica, Vol. 46 (2005), No. 2, 65--66

Persistent URL: <http://dml.cz/dmlcz/702109>

Terms of use:

© Univerzita Karlova v Praze, 2005

Institute of Mathematics of the Academy of Sciences of the Czech Republic provides access to digitized documents strictly for personal use. Each copy of any part of this document must contain these *Terms of use*.



This paper has been digitized, optimized for electronic delivery and stamped with digital signature within the project *DML-CZ: The Czech Digital Mathematics Library* <http://project.dml.cz>

Questions

ALEXEY OSTROVSKY

Neubiberg

Received 11. March 2005

1. Questions

In this section all the sets are supposed to be lying in the Cantor set \mathbf{C} . We denote by \mathbf{P} and \mathbf{Q} the spaces of irrational and rational numbers.

- (1) The author proved [2] that there is a compact quotient map $f: \mathbf{P} \rightarrow \mathbf{Q}^\omega$, but at the same time the image of \mathbf{P} under every n -to-one quotient map is always G_δ .

Question 1. Can the image of a Borel set X under n -to-one quotient map have an arbitrarily high Borel class?

I do not know the answer even for compact quotient maps.

Question 1 would have to be solved in the first place for a simple cases of $X = \mathbf{P} \times \mathbf{Q}$.

Question 2. Is every Borel set X a countable union of pairwise disjoint closed in X sets X_i obtained (starting with a point) by multiplying and complementing¹?

According to [3, Theorems 7, 12] it is sufficient to consider Δ_α^0 -set X .

F. van Engelen in his dissertation gave a characteristic of homogeneous Borel sets of ambiguous class 3 with the same operations.

Bundeswehr University Munich, D-8557 Neubiberg, Germany

2000 *Mathematics Subject Classification.* Primary 54C10, 54H05, 54E40.

Key words and phrases. Quotient map, Borel sets.

complementing by dense closed embedding. X_i are the sets $M_\alpha^I, A^I, M_\alpha^{II}, A_\alpha^{II}$ (and their products) defined in [2], p. 334.

References

- [1] ENGELEN VAN F., Homogeneous zero-dimensional absolute Borel sets *Ph.D. thesis CWI Tract 27* (1986)
- [2] OSTROVSKY, A., About quotient finite-to-one maps, in: *Continuous functions on topological spaces, Latv. Gos. Univ., Riga* (1986) 126 – 133 (in Russian)
- [3] OSTROVSKY, A., On a question of L. V. Keldysh concerning the structure of Borel sets, *Math. USSR Sbornik 39, No 2* (1986) 317 – 337