

Laczkovich, M.; Miller, Arnold W.

Measurability of functions with approximately continuous vertical sections and measurable horizontal sections. (English) [Zbl 0852.28004](#)

Colloq. Math. 69, No. 2, 299-308 (1995).

It is well-known that each function $f : \mathbb{R}^2 \rightarrow \mathbb{R}$ with continuous vertical sections and measurable horizontal sections is measurable as a function of two variables. The authors show that this fact is independent of set theory if we replace continuous by approximately continuous. Main results: 1. Let $f : \mathbb{R}^2 \rightarrow \mathbb{R}$ be a function with approximately continuous vertical sections and Baire 1 horizontal sections. Then f is Baire 2. 2. Suppose there exists a real-valued measurable cardinal. Then for every function $f : \mathbb{R}^2 \rightarrow \mathbb{R}$ and $\alpha < \omega_1$, if all vertical sections of f are approximately continuous and all horizontal sections of f are Baire α , then f is Baire $\alpha + 1$. 3. Suppose that \mathbb{R} can be covered by ω_1 closed null sets. Then there exists a nonmeasurable function $f : \mathbb{R}^2 \rightarrow \mathbb{R}$ such that each section f_x is approximately continuous and each section f^y is Baire 2. 4. In the random real model, every function $f : \mathbb{R}^2 \rightarrow \mathbb{R}$ with approximately continuous vertical sections and measurable horizontal sections is measurable as a function of two variables.

Reviewer: [T.Natkaniec \(Bydgoszcz\)](#)

MSC:

[28A20](#) Measurable and nonmeasurable functions, sequences of measurable functions, modes of convergence

Cited in **3** Documents

[03E35](#) Consistency and independence results

[28A05](#) Classes of sets (Borel fields, σ -rings, etc.), measurable sets, Suslin sets, analytic sets

Keywords:

measurability of functions; approximate continuity; separate continuity; real-valued measurable cardinal; random real model

Full Text: [DOI](#) [arXiv](#) [EuDML](#)