

CONVEXITY AND REMOVABLE SETS

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This is joint work with Dušan Pokorný, and is still in progress. We study subsets of Euclidean spaces that are negligible from the point of view of convexity of functions. A closed set $F \in \mathbb{R}^d$ is said to be *c-removable* (the “c” stands for “convexity”) if the following is satisfied: whenever a continuous function $f : \mathbb{R}^d \rightarrow \mathbb{R}$ is locally convex on the complement of F , it is convex on the whole \mathbb{R}^d .

Five years ago, at the 37th Summer Symposium in Real Analysis (although that particular one was technically a “Winter Symposium” as it took place in the Southern Hemisphere), I presented joint results with Dušan Pokorný disproving a conjecture by Jacek Tabor and Józef Tabor that *c-removability* is characterized by *interval thinness*, a notion that they introduced, which means that the set is essentially transparent in all directions: We found examples of sets which are *c-removable*, yet not intervally thin (one such example we call the *Holey Devil’s Staircase*). We also found many examples of non-*c-removable* discontinua.

However, the question remained open of the existence of a nontrivial *c-removable continuum*. We now have such examples along with other new results, providing a better understanding of the notion of *c-removability*.

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