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A reasonably tame Cantor set

We construct a Cantor set $E \subset [0, 1]$ such that for every $n \in \mathbb{N}$ and every bounded $f : A \rightarrow \mathbb{R}^m$ definable in any polynomially bounded o-minimal expansion of the real field, the image $f(E^n \cap A)$ is Minkowski null. It follows that the expansion of the real field by E does not define the set of all natural numbers.

Joint work with Harvey Friedman, Krzysztof Kurdyka and Chris Miller.