$\mathbb{Z}/p$-acyclic resolutions in the "strongly countable" $\mathbb{Z}/p$-dimensional case

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Abstract: We will take a brief look at resolution theorems in extension theory by R. Edwards - J. Walsh, A. Dranishnikov and M. Levin. We will see how they lead to the following resolution theorem.

Theorem: Let X be a nonempty compact metrizable space, let $l_1 \leq l_2 \leq \ldots$ be a sequence of natural numbers, and let $X_1 \subset X_2 \subset \ldots$ be a sequence of nonempty closed subspaces of X such that for each k in $\mathbb{N}$, $\dim_{\mathbb{Z}/p} X_k \leq l_k < \infty$. Then there exists a compact metrizable space Z, having closed subspaces $Z_1 \subset Z_2 \subset \ldots$, and a surjective cell-like map $\pi : Z \to X$, such that for each k in $\mathbb{N}$,

(a) $\dim Z_k \leq l_k$,

(b) $\pi(Z_k) = X_k$, and

(c) $\pi|_{Z_k} : Z_k \to X_k$ is a $\mathbb{Z}/p$-acyclic map.

It is not required that X be the union of all X_k, nor that Z be the union of all Z_k. This result generalizes Dranishnikov's $\mathbb{Z}/p$-resolution theorem, and runs parallel to a similar theorem of S. Ageev, R. Jiménez, and L. Rubin, who studied the situation where the group was $\mathbb{Z}$.

We will also discuss a possible generalization – what happens if the groups $\mathbb{Z}$ or $\mathbb{Z}/p$ are replaced by an arbitrary abelian group G.

References

[1] L. Rubin and V. Tonić, *$\mathbb{Z}/p$-acyclic resolutions in the strongly countable $\mathbb{Z}/p$-dimensional case*, arXiv: 1101.2480