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Resolutions for Metrizable Compacta in Extension Theory

We shall speak about a K-resolution theorem for simply connected CW-complexes K in extension theory in the class of metrizable compacta X. This means that if $\dim X \leq K$ (in the sense of extension theory), n is the first element of $\mathbb{N}$ such that $G = \pi_n(K) \neq 0$, and it is also true that $\pi_{n+1}(K) = 0$, then there exists a metrizable compactum Z and a surjective map $\pi\colon Z \to X$ such that:

(a) π is G-acyclic,

(b) $\dim Z \leq n+1$, and

(c) $\dim Z \leq K$.

If additionally, $\pi_{n+2}(K) = 0$, then we may improve (a) to the statement,

(aa) π is K-acyclic.

To say that a map π is K-acyclic means that each map of each fiber $\pi^{-1}(x)$ to K is nullhomotopic.

In case $\pi_{n+1}(K) \neq 0$, we obtain a resolution theorem with a weaker outcome. Nevertheless, it implies the G-resolution theorem for arbitrary abelian groups G in cohomological dimension $\dim_G X \leq n$ when $n \geq 2$.

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