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Do universal compacta exist in the theory of cohomological dimension?

If C is a class of spaces, then an element $X \in C$ is called universal for C if each $Y \in C$ embeds in X. For example, the Hilbert cube is a universal object for the class of compact metrizable spaces. It is a classical fact that for all $n \geq -1$, there exist universal compacta in the class of metrizable compacta of (covering) dimension $\leq n$.

If G is an abelian group, then for each paracompact space X, $\dim_G X$ denotes the cohomological dimension of X with coefficients in G. For these theories of cohomological dimension, there is no known parallel to the above mentioned statement about universal compacta for dimension. That is, in almost all cases, we do not know if there are universal objects for the class of metrizable compacta X with $\dim_G X \leq n$.

It is suspected that there do not exist such universal compacta; we shall provide some evidence to support that notion. We shall also present some ideas that could help in developing a proof of the nonexistence of universal objects in cohomological dimension.