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A non-standard homology theory with some nice properties

Let K be an arbitrary small subcategory of the category of pairs (X, A) , where X is paracompact and A is closed in X and continuous maps between such pairs. Let G be an Abelian group, and let $*G$ be its suitable elementary extension.

We present a microsimplicial homology theory for spaces in K with coefficients in $*G$, related to the McCord homology theory. Our homology theory, unlike McCord homology, is based on non-near standard microsimplices as well as near-standard microsimplices.

This homology theory has the following properties:

- The homology theory satisfies all the Eilenberg-Steenrod axioms including exactness.
- The homology theory is continuous with respect to resolutions of spaces.
- For compact spaces the homology theory coincides with Čech homology. (Note that the homology theory is not defined for an arbitrary coefficient group!)
- For simplicial pairs (K, L) we have a characterization of the homology groups.
- Let P be a one-point space, and X a space in K . Then $f: P \rightarrow X$ and $g: P \rightarrow X$ induce the same map in homology if and only if $f(P)$ and $g(P)$ lie in the same quasi-component of X .