

Categorical groups for exterior spaces

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The category of exterior spaces is a (co)complete extension of the category of spaces and proper maps which is often used to study non-compact spaces. This category admits some closed model structures by taking weak equivalences associated to homotopy groups induced by either the semi-open interval or by the space of natural numbers. As in standard homotopy theory an interesting technique to solve some important questions is the construction of algebraic models for the category of exterior n -types.

In this communication, we would like to present three possible algebraic models for exterior 2-types: pro-categorical groups and the exterior categorical groups induced by the semi-open interval and by the set of natural numbers.

A long exact sequence gives some relations between all these categorical groups and the higher dimensional analogues associated to an exterior space with a base ray and the relation between pro-categorical groups and exterior categorical groups will be also analyzed. The aim of our work is to find adequate algebraic models for 2-types of exterior spaces with one Freudenthal end. Another objective is the adaptation of all these exterior categorical groups to give algebraic models of 2-types in shape, strong shape and proper homotopy theories.

REFERENCES

- [1] J. García Calcines, M. García Pinillos, L.J. Hernández, *A closed model category for proper homotopy and shape theories*, Bull. Aust. Math. Soc. 57 (1998) 221-242.
- [2] J. I. Extremiana, L.J. Hernández, M.T. Rivas , *Postnikov factorizations at infinity*, Top. Appl. 153 (2005) 370-393.
- [3] A. R. Garzón, J. G. Miranda, A. Del Río, *Tensor structures on homotopy groupoids of topological spaces*, International Mathematical Journal 2 (2002) 407-431.

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