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Relative actions and algebraic exponentiation

For a relative exact homological category (\mathbb{C}, \mathbb{E}) , we define “relative points” over an arbitrary object in \mathbb{C} , and show that they form an exact homological category. In particular, it follows that the full subcategory of nilpotent objects in an exact homological category form an exact homological category. These nilpotent objects are defined with respect to a Birkhoff subcategory in \mathbb{C} as defined by T. Everaert in his Ph. D. thesis. In addition, we introduce:

- (i) relative actions and show that just as in the classical case, there is an equivalence of categories between the category of relative points over an object and the category of relative actions for the same object;
- (ii) relative algebraic exponentiation where nilpotent groups are an example.

This is joint work with Tamar Janelidze-Gray.