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On the local cartesian closure of exact completions

Carboni and Rosolini have given in [1] a characterisation of (local) cartesian closure of exact completions in terms of a property of their projectives, but a recently discovered oversight in their argument entails that such characterisation is only valid when the projectives are internally projectives, i.e. closed under products (pullbacks for local cartesian closure).

We will introduce a different condition on a category with weak finite limits which alone implies that its exact completion is locally cartesian closed. This condition was inspired by an axiom in the context of constructive set theory and originally applied to a category defined from Martin-Löf type theory. However, we will see how this condition arises in the homotopy-theoretic context as well, where homotopy categories provide natural examples of categories with weak finite limits.

REFERENCES:

[1] A. Carboni and G. Rosolini, Locally cartesian closed exact completions, *J. Pure Appl. Algebra* 154 (2000) 103–116.