

Weak exponentiability in topological categories

The category \mathbf{Top} of topological spaces and continuous functions is weakly cartesian closed, that is, there exist weak exponentials, where *weak* means as usual that one drops the uniqueness condition.

In this talk we extend Rosický's construction [1] to other topological categories over \mathbf{Set} , which are given by the (\mathbb{T}, V) -Cat setting [2, 3], for example the categories \mathbf{Met} of Lawvere generalized metric spaces, \mathbf{App} of Lowen approach spaces, and $\mathbf{ProbMet}$ of probabilistic metric spaces.

Weak cartesian closedness is one of the hypotheses used by Rosický to conclude the cartesian closedness of the free exact completion of a category. We apply this result to (\mathbb{T}, V) -Cat, for a suitable quantale V and \mathbf{Set} -monad \mathbb{T} .

This talk reports on ongoing work that will appear in [4].

References

- [1] J. Rosický, Cartesian closed exact completions, *Journal of Pure and Applied Algebra* 142 (1999) 261–270.
- [2] Maria Manuel Clementino and Walter Tholen, Metric, topology and multicategory – a common approach, *Journal of Pure and Applied Algebra* 179 (2003) 13–47.
- [3] Maria Manuel Clementino and Dirk Hofmann, Topological features of lax algebras, *Applied Categorical Structures* 11 (2003) 267–286.
- [4] Maria Manuel Clementino, Dirk Hofmann and Willian Ribeiro, Cartesian closed exact completions in topology, *in preparation*.