Branched coverings of quasi locally connected toposes

Marta Bunge

Just as in topology, the notion of a complete spread in topos theory [2] is a useful tool in describing branched coverings of an $\mathcal{S}$-bounded locally connected topos $\mathcal{E}$. Inspired once again by topology, the locally connected assumption on the domains of complete spreads was removed in [3], and replaced in [4] by an assumption of quasi local connectedness, satisfied by all Grothendieck toposes. In this context, the Lawvere distributions [5] (suitable in the locally connected case) are substituted by distributions with values in the category of zero-dimensional (rather than of discrete) locales in $\mathcal{S}$.

The purposes of this talk are as follows. The first is to examine the theory presented in [3, 4] with respect to the validity of the complete spread analysis of branched coverings [2] when $\mathcal{E}$ is assumed to be just quasi locally connected. In particular, this gives new topological applications to branched coverings over an arbitrary topological space E. The second is to exploit the comprehensive factorization of a geometric morphism [3, 4] in order to begin, in the manner of [1], a study of the 'fundamental groupoid topos' of a quasi locally connected topos $\mathcal{E}$ over an arbitrary base $\mathcal{S}$. A particular instance is the case of a Grothendieck topos $\mathcal{E}$.

REFERENCES

[1] M. Bunge, *Galois Groupoids and Covering Morphisms in Topos Theory*, in: G. Janelidze et al. (eds), Galois Theory, Hopf Algebras, and Semiabelian Categories, Fields Institute Communications, American Mathematical Society (2004) 131-162.

[2] M. Bunge and J. Funk, *Singular Coverings of Toposes*, Lecture Notes in Mathematics 1890, Springer-Verlag, 2006.

[3] M. Bunge and J. Funk, Quasicomponents in topos theory: the hyperpure, complete spread factorization, *Math. Proc. Cambridge Phil. Soc.* 142 (2007) 47-62.

[4] M. Bunge and J. Funk, Quasi locally connected toposes, *Theory and Applications of Categories* 18:08 (2007) 209-239.

[5] F. W. Lawvere. Intensive and extensive quantities, *Notes for the lectures given at the workshop on Categorical Methods in Geometry*, Aarhus, 1983.