$(\infty, 2)$-Topoi and descent

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Abstract.

The goal of this talk is to introduce the notion of a Grothendieck $(\infty, 2)$-topos as a presentable $(\infty, 2)$-category satisfying a categorified version of the descent axiom for $(\infty, 1)$-topoi of Rezk-Lurie, which we call fibrational descent. As the name indicates, fibrational descent axiomatizes the structure of internal fibrations in an $(\infty, 2)$-category and it is closely related to the straightening-unstraightening equivalence of Grothendieck-Lurie. After presenting the main definition, I will give an overview of several different ways of characterising $(\infty, 2)$-topoi, which includes a 2-dimensional version of Giraud's theorem and categorified Lawvere-Tierney axioms. Moreover, I will show how the theory of internal categories in an $(\infty, 1)$-topos (as develop by Martini and Wolf) can be embedded into our formalism as $(\infty, 1)$-localic $(\infty, 2)$-topoi. If time permits, I will explain how to construct a version of the Yoneda embedding in any $(\infty, 2)$-topos and a theory of partially lax Kan extensions.

References

[1] Fernando Abellán, Louis Martini, $(\infty, 2)$-*Topoi and descent*, arXiv: 2410.02014