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One: a characterization of skeletal objects for the Aufhebung of Level 0 in certain toposes of spaces.

In his 1990 *Thoughts on the future of category theory* Lawvere says that "It seems that a significant portion of algebraic geometry and differential geometry does not depend so much on the particular algebraic theory used to construct models for it but is of a more fundamental conceptual nature. One-dimensional, like connected, is actually a philosophical concept, related to the minimal Hegelian level of figures which must be considered within an arbitrary space in order to determine that space's connectedness." He then proposes to consider the Aufhebung relation between levels (or essential localizations) in a category. "The basic idea is simply to identify dimensions with levels and then try to determine what the general dimensions are in particular examples." This determination is well-understood only in a few cases. Namely, in those examples worked out by Lawvere in his theory of graphic toposes [4], those discussed by Lawvere and Kelly [1], and the non-graphic 'combinatorial' pre-cohesive presheaf toposes analyzed in [2]. Starting from an arbitrary local hyperconnected geometric morphism (whose centre is thought of as a level 0) I will define what it means to be 'naively 1-dimensional'. I will then show that for many pre-cohesive presheaf toposes (including the known examples) the naively 1-dimensional objects coincide with the skeletal objects for the Aufhebung of level 0.

References:

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[3] Lawvere, F. W. Some thoughts on the future of category theory. Category theory (Como, 1990), *Lecture Notes in Math.*, 1488 (1991).

[4] Lawvere, F. W. Linearization of graphic toposes via Coxeter groups. Category theory 1999 (Coimbra). *J. Pure Appl. Algebra* 168 (2002).