Invertible cells in weak ω-categories

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Abstract.

Coinductively invertible cells play a key role in the homotopy theory of strict ω-categories [3], allowing one to define weak equivalences among them. The definition of coinductively invertible cell generalises to weak ω-categories, suggesting the existence of a similar homotopy theory for weak ω-categories. Such cells have been studied by Fujii et al. [2] for Batanin and Leinster's weak ω-categories [4]. Using the new description of weak ω-categories and their computads given by Dean et al. [1], we extend and give alternative proofs of their results. We provide sufficient conditions for a cell in a weak ω-category X to be invertible, and show that those conditions are also necessary when X is free on a finite-dimensional computad. We show in particular that coherence cells and composites of invertible cells are invertible by explicitly constructing an inverse.

References

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