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Test categories associated to higher operads

Weak higher categories can be described using Batanin n-operads (algebras over a reasonnable n-operad can be seen as a notion of n-category). For a given n-operad A, there is a corresponding category of presheaves, called A-cellular sets with some nice properties: the category of A-algebras can be described as the category of A-cellular sets satisfying the Segal condition (for $n = 1$, we recover the description of categories as special simplicial sets). In order to define the homotopy theory of A-algebras, one can first define the homotopy theory of A-cellular sets: after we proved that A-cellular sets are presheaves on a test category, we can apply a general machinery to get a model category structure on A-cellular sets which is Quillen equivalent to (a left Bousfield localization of) topological spaces. All this can even be generalized in the frame work of Mark Weber's parametric right adjoint monads. This leads to a very general picture to understand the weakening of algebraic structures and its relationship with homotopy types.

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