

Homotopy categories associated to families and their behaviour

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Given a model category M , it is well known how to construct an associated derivator and do the homotopy theory. When we consider a family of model categories over a base, $E \rightarrow C$ (described as a Grothendieck fibration), one can study the associated category of sections. If the transition functors in the family do not admit adjoints (and such examples indeed arise in practice), the homotopy theory becomes much more complex and one cannot simply apply the formalism of model categories and associated derivators.

In this talk, we would like to discuss how to tackle the problem of associating a suitable diagram of homotopical categories to $E \rightarrow C$. We show that there is a reasonable way to introduce “derived sections” of such a family, avoiding the technical excess of higher categories. The proposed machinery is flexible enough to allow proofs of interesting adjunction results between the obtained homotopical categories. Applications then include homotopical algebra, where we reprove Deligne conjecture without the use of operads.