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Bousfield localization and algebras over colored operads

We provide a very general approach to placing model structures and semi-model structures on algebras over symmetric colored operads. Our results require minimal hypotheses on the underlying model category \mathcal{M} , and these hypotheses vary depending on what is known about the colored operads in question. We obtain results for the classes of colored operad which are cofibrant as a symmetric collection, entrywise cofibrant, or arbitrary. As the hypothesis on the operad is weakened, the hypotheses on \mathcal{M} must be strengthened. Via a careful development of the categorical algebra of colored operads we provide a unified framework which allows us to build (semi-)model structures for all three of these classes of colored operads. We then apply these results to provide conditions on \mathcal{M} , on the colored operad O , and on a class \mathcal{C} of morphisms in \mathcal{M} so that the left Bousfield localization of \mathcal{M} with respect to \mathcal{C} preserves O -algebras.

References:

- [1] David White and Donald Yau, Bousfield Localization and Algebras over Colored Operads, arXiv 1503.06720, 2015.
- [2] David White, Model structures on commutative monoids in general model categories, arXiv 1403.6759, 2014.
- [3] David White, Monoidal Bousfield localizations and algebras over operads, arXiv 1404.5197, 2014.

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