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Stable left and right Bousfield localisations. (English) Zbl 1297.55020

Glasg. Math. J. 56, No. 1, 13-42 (2014).

Many interesting model categories arise by enlarging the class of weak equivalences in a given (simpler) model category $\mathcal{C}$. Often this is achieved by forming the *left Bousfield localization* of $\mathcal{C}$ with respect to a class of maps S. Left Bousfield localizations are known to exist if $\mathcal{C}$ and S satisfy suitable assumptions, see e.g. [*P. S. Hirschhorn*, Model categories and their localizations. Mathematical Surveys and Monographs. 99. Providence, RI: American Mathematical Society (AMS) (2003; Zbl 1017.55001)].

In the paper under review, the authors define a class of maps S in a stable model category $\mathcal{C}$ to be *stable* if the S-local objects are closed under suspension. The main results state that if in this situation the left Bousfield localization exists, then it has various desirable properties: It is again a stable model structure, it is right proper if $\mathcal{C}$ is, it has an explicit set of generating acyclic cofibrations if $\mathcal{C}$ is proper and cellular, and it interacts well with monoidal products. The authors also establish corresponding results for right Bousfield localizations and discuss applications to Morita theory and spectral model categories.

Reviewer: Steffen Sagave (Bonn)

MSC:

55U35 Abstract and axiomatic homotopy theory in algebraic topology
55P42 Stable homotopy theory, spectra
55P60 Localization and completion in homotopy theory
18E30 Derived categories, triangulated categories (MSC2010)
16D90 Module categories in associative algebras

Keywords:

Bousfield localization; stable model category

Full Text: DOI arXiv

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paper as accurately as possible without claiming the completeness or perfect precision of the matching.