

Mandell, M. A.; May, J. P.

Equivariant orthogonal spectra and S -modules. (English) Zbl 1025.55002
Mem. Am. Math. Soc. 755, 108 p. (2002).

It is now standard theory that there are model categories for stable homotopy theory which are symmetric monoidal with respect to the smash product. The emergence of these during the past ten years is a major technical advance to which several mathematicians (including the authors of this monograph) have made substantial contributions.

Two of the most versatile models are the category of orthogonal spectra (see *J. P. May* [*J. Pure Appl. Algebra* 19, 299-346 (1980; [Zbl 0469.18008](#)); see also *M. A. Mandell, J. P. May, S. Schwede* and *B. Shipley* [*Proc. London Math. Soc.* 82, 441-512 (2001; [Zbl 1017.55004](#))] and the category of S -modules (see *A. D. Elmendorf, I. Kriz, M. A. Mandell* and *J. P. May* [*Rings, modules and algebras in stable homotopy theory*, AMS Mathematical surveys and monographs vol. 47 (1997; [Zbl 0894.55001](#))]).

Chapter 1 of the present monograph establishes a Quillen equivalence between these two categories, and consequently Quillen equivalences between corresponding categories of [commutative] orthogonal ring spectra and [commutative] S -algebras, as well as between appropriately-related categories of modules over algebras.

From Chapter 2 onwards, the focus shifts to the G -equivariant case, where G is a compact Lie group. Model structures are introduced on the category of orthogonal G -spectra, and on categories of ring and module G -spectra. Precise analogues of the non-equivariant results in Chapter 1 are proved. Then change of rings functors (and change of universe ones) are studied, along with fixed point and orbit functors. The comparisons among G -spectra, orthogonal G -spectra and S_G -modules are shown to respect these.

This monograph is likely to become a standard reference. Its clear expository style provides a wealth of explicit technical information which will be welcomed by future researchers. The material on the G -equivariant case is particularly valuable, but the non-equivariant results are also of interest to a wide spectrum of stable homotopy theorists.

Reviewer: [C.A.Robinson \(Coventry\)](#)

MSC:

- [55P42](#) Stable homotopy theory, spectra
- [55P91](#) Equivariant homotopy theory in algebraic topology
- [55P43](#) Spectra with additional structure (E_∞ , A_∞ , ring spectra, etc.)
- [55-02](#) Research exposition (monographs, survey articles) pertaining to algebraic topology

Cited in **4** Reviews
Cited in **70** Documents

Keywords:

orthogonal spectra; S -modules; equivariant stable homotopy theory; fixed point spectra; orbit spectra

Full Text: [DOI](#)