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Modules over operads and functors

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(Submitted on 24 Apr 2007 (v1), revised 18 Jan 2008 (this version, v4), **latest version 25 Feb 2009 (v5)**)

In the theory of operads we consider functors of generalized symmetric powers defined by sums of coinvariant modules under actions of symmetric groups. One observes classically that the construction of symmetric functors provides an isomorphism from the category of symmetric modules to a subcategory of the category of functors on the base category. The purpose of this book is to obtain a similar relationship for functors on a category of algebras over an operad.

We observe that right modules over operads, symmetric modules equipped with a right operad action, give rise to functors on categories of algebras and we prove that this construction yields an embedding of categories. Then we check that right modules over operads form a model category. In addition we prove that weak-equivalences of right modules correspond to pointwise weak-equivalences at the functor level. As a conclusion, we obtain that right modules

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over operads supply good models for the homotopy of associated functors on algebras over operads.

Comments: 185 pages. Initial article transformed into a book project. This version is complete and submitted for publication. There are only very minor (spelling) corrections in v4, but I have added a hyperTeX link to an updated list of "Misprints, Errata and Addenda" on my web page. These updates will be made only on the final version of the book

Subjects: **Algebraic Topology (math.AT)**

MSC classes: 18D50; 55P48; 18G55; 18A25

Cite as: **[arXiv:0704.3090](#) [math.AT]**
(or **[arXiv:0704.3090v4](#)**
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Submission history

From: Benoit Fresse [[view email](#)]

[v1] Tue, 24 Apr 2007 13:28:01 GMT (35kb)

[v2] Tue, 29 May 2007 15:31:57 GMT (36kb)

[v3] Thu, 8 Nov 2007 22:38:10 GMT (103kb)

[v4] Fri, 18 Jan 2008 10:45:08 GMT (104kb)

[v5] Wed, 25 Feb 2009 09:29:30 GMT (0kb,l)

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