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A note on Frobenius-Eilenberg-Moore objects in dagger 2-categories. (English) Zbl 07420163
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Dagger Frobenius monads and categories of Frobenius-Eilenberg-Moore algebras for such monads were first considered in [*C. Heunen* and *M. Karvonen*, Theory Appl. Categ. 31, 1016–1043 (2016; [Zbl 1378.18003](#)); Electron. Notes Theor. Comput. Sci. 319, 217–237 (2015; [Zbl 1351.68100](#))], where it was shown that they include the important example of quantum measurements. This paper pursues a formal theory of dagger Frobenius monads in the spirit of [*R. Street*, J. Pure Appl. Algebra 2, 149–168 (1972; [Zbl 0241.18003](#)); *S. Lack* and *R. Street*, J. Pure Appl. Algebra 175, No. 1–3, 243–265 (2002; [Zbl 1019.18002](#))]. It is shown that the free completion of a 2-category under Eilenberg-Moore objects extends to the dagger context, provided one is ready to work with those dagger Frobenius monads for which the endofunctor suitably commutes with the unit. Defining dagger lax functors and dagger lax-limits of such functors, the author demonstrates that Frobenius-Eilenberg-Moore objects are examples of such limits.

Reviewer: [Hirokazu Nishimura \(Tsukuba\)](#)

MSC:

- [18A35](#) Categories admitting limits (complete categories), functors preserving limits, completions
- [18A40](#) Adjoint functors (universal constructions, reflective subcategories, Kan extensions, etc.)
- [18C15](#) Monads (= standard construction, triple or triad), algebras for monads, homology and derived functors for monads
- [18C20](#) Eilenberg-Moore and Kleisli constructions for monads
- [18D70](#) Formal category theory
- [18N10](#) 2-categories, bicategories, double categories
- [18N15](#) 2-dimensional monad theory

Keywords:

dagger category; Frobenius monad; lax functor; Kleisli category; Eilenberg-Moore category

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