Slack Hopf monads

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Abstract.

In this talk, based on [1], we introduce *slack Hopf monads* and investigate their connection to the quasi-Hopf algebras of Drinfel′d. Opmonoidal monads are monads compatible with the monoidal structure: their Eilenberg-Moore category is monoidal and the forgetful functor is strong monoidal [2]. A left Hopf monad is an opmonoidal monad satisfying an extra rigidity condition that on a monoidal left closed category ensures that: (a) the Eilenberg-Moore category is left closed too, and; (b) the forgetful functor is a strong closed functor [3]. In slack left Hopf monads the condition (b) is relaxed to an (essentially unique) slack Hopf structure. Furthermore, the condition of monoidality is dropped, requiring only a magma category. This allows to capture the monads induced by tensoring with a quasi-Hopf algebra (these are not necessarily opmonoidal nor Hopf). We characterise quasi-Hopf algebras among those quasi-bialgebras that induce slack Hopf monads.

References

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[2] I. Moerdijk, *Monads on tensor categories*, J. Pure Appl. Algebra 168 (2–3) (2002) 189–208.

[3] A. Bruguières, S. Lack, A. Virelizier, *Hopf monads on monoidal categories*, Adv. Math. 227 (2) (2011) 745–800.