

Projections of weak Hopf algebras and weak Yang-Baxter operators

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In this talk we show that, for a weak Hopf algebra projection $g : B \rightarrow H$, the subalgebra of coinvariants B_H of B , defined in [1], is a Hopf algebra in the category ${}^H_H\mathcal{YD}$, i.e., the category of Yetter-Drinfeld modules defined by Böhm in [4]. Also, we complete this result, obtaining a one to one correspondence between Hopf algebras in the category ${}^H_H\mathcal{YD}$ and projections of weak Hopf algebras $g : B \rightarrow H$ ([2] and [3]).

To prove these results, in [3] we introduce the notions of weak Yang-Baxter operator and weak braided Hopf algebra and we show that it is possible to construct non-trivial examples of this algebraic structures using Hopf algebras in ${}^H_H\mathcal{YD}$ where the antipode of H is an isomorphism. The definition of weak braided Hopf algebra, generalizes the one introduced by Takeuchi in [8], and as a particular instances we obtain the definition of weak Hopf algebra (see [5]) and, if the weak Yang-Baxter operator is the braiding of a braided category, the new notion of weak Hopf algebra in a braided setting.

Finally, we want to emphasize that these results give a good weak Hopf algebra interpretation of well-known theorems proved by Radford [7], Majid [6] and others in the Hopf algebra setting, that provides a correspondence between Hopf algebra projections and Hopf algebras in the category of Yetter-Drinfeld modules.

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