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A categorical approach to Hopf algebras and their generalizations: Hopf braces and Hopf bracoids

Abstract

The aim of this talk consists of studying Hopf braces and Hopf bracoids in a braided monoidal setting. After an initial section in which we are going to recall some general results about Hopf algebras in a braided monoidal category, then we will introduce Hopf braces, motivating their importance since they induce solutions to the Quantum Yang Baxter Equation. Moreover, we will see that the category of Hopf braces is equivalent to the category of the so-called invertible 1-cocycles. Later on, we will define the category of modules over an invertible 1-cocycle and we will see that this category is equivalent to the category of modules over a Hopf brace. To finish, the notion of Hopf bracoid will be introduced as a generalization of the Hopf brace structure. We will see that any Hopf brace induces different and non-isomorphic examples of Hopf bracoids, and also that many properties that Hopf braces satisfy can be generalized to this setting. Furthermore, we will prove that, under certain assumptions, the category of Hopf bracoids is isomorphic to the category of 1-cocycles.