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Drabant, Bernhard, University of Cambridge, UK, and Yuri Bespalov, Bogolyubov Institute for Theoretical Physics, Kiev, Ukraine

Cross Product Bialgebras

The subject of the talk are (cocycle free) cross product bialgebras. We introduce Hopf pairs and find a complete classification of so-called trivalent cross product bialgebras by trivalent Hopf pairs through (co-)modular and universal properties. The various types of the well known cross products with bialgebra structure existing so far in the literature can be described within this classification scheme. As a by-product we find a new class of cross product bialgebras. We are working in the general setting of braided monoidal categories which allows us to apply our results in particular to the braided category of Hopf bimodules over a Hopf algebra. The recently discovered double biproduct is seen to be a twisting of a certain tensor product bialgebra in this category.