

Braided tensor product of Hilbert spaces twisted by corepresentation of quantum codouble

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Abstract

We study analogues for Hilbert space corepresentations and coactions on C^* -algebras of locally compact quantum groups of the following well-known results in Hopf algebra theory.

First, modules or comodules over a quasitriangular Hopf algebra form a braided monoidal category, that is, there is a natural isomorphism $X \otimes Y \cong Y \otimes X$ with good properties. In this case, there is also a braided tensor products for comodule algebras. A particular example of a quasitriangular Hopf algebra is the Drinfeld double of a (finite-dimensional) Hopf algebra. Its modules are the Yetter–Drinfeld modules over the original Hopf algebra.

The main tool to translate these results to the Hilbert space setting are multiplicative unitaries. The analogue of Yetter–Drinfeld algebras were already introduced by Nest and Voigt. In joint work with Woronowicz, we interpret these as coactions of a locally compact quantum group, and we develop a parallel theory on the Hilbert space level.

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