

## On cross product Hopf algebras

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For  $A, B$  algebras and coalgebras but not necessarily bialgebras in a braided monoidal category  $\mathcal{C}$  we give necessary and sufficient conditions for which a cross product algebra and a cross coproduct coalgebra structure afford on  $A \otimes B$  a bialgebra structure in  $\mathcal{C}$ . We also find sufficient conditions for which such a cross product bialgebra is a Hopf algebra in  $\mathcal{C}$ . We then describe those cross product Hopf algebras that are a double cross (co)product, a biproduct or, more generally, a smash (co)product Hopf algebra, respectively, and to each of them we associate the appropriate Hopf algebra projection context.

This is joint work with S. Caenepeel and B. Torrecillas.