Graded braided commutativity in Hochschild cohomology obtained via duoidal categories

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Among several cohomology theories, the Hochschild cohomology of a bialgebra with coefficients in its base field is known to have a cup product which is graded commutative. Our aim is to see in which contexts the braided analogue of this statement holds. Given a braided bialgebra, is the cup product of its Hochschild cohomology graded braided commutative? The main difficulty comes before the question: we need to define a braiding on the cohomology spaces for this statement to make sense. Mastnak, Pevtsova, Schauenburg and Witherspoon have given a positive answer in the case of Nichols algebras wich are either finite dimensional or can be realized as Yetter-Drinfeld modules over a finite dimensional Hopf algebra. They use inner hom objects to visualize the bar complex in the same Yetter-Drinfeld category as the original algebra.I will speak about a joint work with Andrea Solotar, where we have posed the question and given a positive answer under weaker finiteness conditions. This context includes Nichols algebras such as the Jordan plane and the Jordan superplane, which are not finite dimensional nor can be realized as braided bialgebras over a finite group. The key is to look at a finitely generated projective bimodule resolution inside a duoidal category of chain complexes of bimodules

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