

The Hopf automorphism group and the quantum Brauer group

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We lift a known exact sequence for the quantum Brauer group of a Hopf algebra over a commutative ring to the level of a braided monoidal category. This permits one to get new relations that describe the quantum Brauer group of a Hopf algebra H over a field k . Let B be a Hopf algebra in $\mathcal{C} = {}^H_H\mathcal{YD}$, the category of Yetter-Drinfel'd modules over H . We consider the quantum Brauer group $\text{BQ}(\mathcal{C}; B)$ of B in \mathcal{C} , which is isomorphic to the usual quantum Brauer group $\text{BQ}(k; B \rtimes H)$ of the Radford biproduct Hopf algebra $B \rtimes H$. We find that under a certain symmetricity condition on the braiding in \mathcal{C} , there is an inner action of the Hopf automorphism group of B on the former. We use this fact to generate a new subgroup of the quantum Brauer group for a family of Radford biproduct Hopf algebras $B \rtimes H$. Applying our recent results on the subgroup $\text{BM}(k; B \rtimes H)$ - the Brauer group of module algebras over $B \rtimes H$, - we obtain new estimations of the respective quantum Brauer group. In particular, we get new information on the quantum Brauer group of some known Hopf algebras.