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The Eckmann-Hilton argument in duoidal categories

We will go over the basics of duoidal categories, illustrating with a number of examples. As monoidal categories provide a context for monoids, duoidal categories provide one for duoids and bimonoids. Our main goal is to discuss a number of versions of the classical Eckmann-Hilton argument which may be formulated in this setting. As an application we will obtain the commutativity of the cup product on the cohomology of a bimonoid with coefficients in a duoid, an extension of a familiar result for group and bialgebra cohomology.

The talk borrows on earlier work in collaboration with Swapneel Mahajan on the foundations of duoidal categories (2010). The main results are from ongoing work with Javier Coppola. We also rely on work of Richard Garner and Ignacio López-Franco (2016).