

Cointeracting bialgebras

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Pairs of cointeracting bialgebras appear recently in the literature of combinatorial Hopf algebras, with examples based on formal series, on trees (Calaque, Ebrahimi-Fard, Manchon and Bruned, Hairer, Zambotti), graphs (Manchon), posets...

These objects have one product (a way to combine two elements in a single one) and two coproducts (the first one reflecting a way to decompose a single element into two parts, maybe into several ways, the second one reflecting a way to contract parts of an element in order to obtain a new one). All these structures are related by convenient compatibilities.

We will give several results obtained on pairs of cointeracting bialgebras: actions on the group of characters, antipode, morphisms to quasi-symmetric functions... and we will give applications to Hopf algebras of graphs, posets, multigraphs or mixed graphs.