

WEAK STUFFLE ALGEBRAS

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ABSTRACT. Motivated by q -shuffle products determined by Singer from q -analogues of multiple zeta values, we build in this article a generalisation of the shuffle and stuffle products in terms of weak shuffle and stuffle products. Then, we characterise weak shuffle products and give as examples the case of an alphabet of cardinality two or three. We focus on a comparison between algebraic structures respected in the classical case and in the weak case. As in the classical case, each weak shuffle product can be equipped with a dendriform structure. However, they have another behaviour towards the quadri-algebra and the Hopf algebra structure. We give some relations satisfied by weak stuffle products.

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