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Mathematics > Quantum Algebra

Title:Manin products, Koszul duality, Loday algebras and Deligne conjecture

Authors:Bruno Vallette
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Abstract: In this article we give a conceptual definition of Manin products in any category endowed with two coherent monoidal products. This construction can be applied to associative algebras, non-symmetric operads, operads, colored operads, and properads presented by generators and relations. These two products, called black and white, are dual to each other under Koszul duality functor. We study their properties and compute several examples of black and white products for operads. These products allow us to define natural operations on the chain complex defining cohomology theories. With these operations, we are able to prove that Deligne's conjecture holds for a general class of operads and is not specific to the case of associative algebras. Finally, we prove generalized versions of a few conjectures raised by M. Aguiar and J.-L. Loday related to the Koszul property of operads defined by black products. These operads provide infinitely many examples for this generalized Deligne's conjecture.

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